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Authors:
V. Aeminov, A. Eisman, N. Khlyupin, S. Lyubicheva, V. Merkurisov, V. Obraztsov, I. Panteleev (Executive Editor), G. Samsonov, N. Selivanov (Executive Editor), A. Shlyakhov, V. Smislov, B. Zotov, A. Zvirbul

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Subject Index

PART ONE

CRIMINALISTIC METHODOLOGY

CHAPTER I

SUBJECT-MATTER AND GOALS, SYSTEM OF CRIMINALISTICS

1. Subject-Matter and Goals

To eradicate infringements on the law and order, and to do away with crime it is necessary to persistently improve crime detection techniques. Criminalistics has an important role to play in this field. It provides efficient crime detection techniques to specialists. Methods and means employed by criminalistics are also used in crime prevention.

By examining and generalising the methods of crime detection techniques[1] criminalistics creates better methods for crime control. The present stage of criminalistics which has evolved from separate branches to a coherent system of scientific knowledge is characterised by a high degree of a comprehensive use of scientific and technical achievements and by a thorough elaboration of methodological problems, the tactics and methods of crime detection in the interests of justice.

Criminalistics Is a Science of Crime Detection. To detect a crime means to expose all its attending features and identify the criminal. Crimes are uncovered through criminal procedure and operative-search activities. The detection of a crime by means of operative-search activities is secondary to criminal procedure. However, the role of the former in ensuring a swift and full detection of crimes is quite significant. Many crimes are uncovered through operative-search activities.

In terms of a comprehensive character of a crime detection the results of criminal procedure and operative-search activities may be the same but their legal substance differs: the results of the latter which are not presented in a legal form are not evidence and cannot serve as a foundation for passing a sentence. To pass a sentence a crime must be investigated and examined by the court in accordance with the criminal procedure established by the law. In other words, a crime uncovered through operative-search activities but not examined cannot give rise to criminal legal consequences. The theory of operative-search activities as far as it concerns crime detection is a component part of the subject-matter of criminalistics. However, following the trend of the differentiation of sciences it detached itself from criminalistics to be included into a general theory of operative-search activities which is an independent branch of scientific knowledge. Nevertheless, the theory of tactical operations and some tactical methods used in operative-search activities, as well as the rules concerning the application of scientific and technical methods and means to detect crimes, belong to criminalistics.

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[1] In this book the term "crime detection" is used in a broad sense. Some authors use it in a narrower sense perceiving crime detection as a part of criminal investigation before there is a defendant in a case.

Criminal procedure and preliminary investigation, in particular, are the subject-matter of the science of criminal procedure. However, the concept "investigation" is also used in criminalistics. It comprises not only the procedural sequence of inquest and preliminary investigation (although it is its main element) but also a system of scientific and technical methods and tactical techniques. In other words, it comprises procedural and criminalistic aspects. Criminalistics elaborates techniques, tactics and methods of criminal investigation proper, i. e., the methods of crime detection in the form of criminal procedure. The methods of crime detection by means of criminal procedure are the criminalistic aspect of crime detection.

It seems that the definition of criminalistics as a science of crime detection most fully reflects its basic purpose: to devise and improve crime detection techniques and instruct how to uncover crimes.

Criminalistics *examines* and *generalises* — criminal practices (committed crimes). The criminalistic analysis of crimes allows to reveal trends (general patterns) of the common and the typical in planning and perpetrating various types (groups) of crimes. To reveal these trends criminalistic analysis should cover a sufficiently representative volume of empirical material collected in corresponding regions over the recent period.

This analysis allows to establish most typical situations in the acts of committing certain types (groups) of crimes and obtain generalised information on the personality of criminals, particular features in planning crimes, typical conditions, methods, means and instruments of crime. The study and generalisation of criminal practices is also geared at establishing the most typical consequences of crimes such as traces and other changes in the physical situation, the damage inflicted and circumstances conducive to the preparation of crimes. In crime detection it is also useful to collect data on the style and methods used by the offenders to cover up their traces. Besides, it is necessary to establish the facts pertaining to the personality and behaviour of the victim.

Crimes are studied not only by criminalistics but also by criminology and criminal law. However, they all tackle different problems. In investigating methods, conditions and material consequences of crimes and other attending circumstances, criminalistics establishes links between these elements of the crime, on the one hand, and the intentions and actions of the criminal, on the other, and through these links, defines the ways and means for an expedient and comprehensive detection of crimes. If one knows how particular crimes are committed and their material impact it is much easier to define the ways and methods for their detection.

Criminalistics also *examines and generalises*:

— investigation practices. The examination and scientific analysis of the practices used in crime detection allow to identify the common and the typical in the work of an investigator when he organises and plans an investigation, proposes investigation theories for typical situations, and when he uses tactical methods in investigation and applies operative-search means;

— the practice of using criminalistic techniques and judicial inquiry in crime detection;

— the application of data of natural, technical and social sciences (philosophy, logic, psychology, economics) in detecting crimes, including expert examinations. In so doing, an analysis is made of the essence of the problems, the opportunities and conditions for, and the efficacy of, using scientific data in uncovering crimes of various types;

— the achievements of natural, technical and social sciences which are the basis of criminalistic techniques and investigation tactics.

By using the results of the examination and scientific generalisation of this extensive practical material and relying on the general theory of law and the existing criminal law and the law of criminal procedure, *criminalistics elaborates*:

— methodology of this branch of science;

— technical criminalistic methods and means, as well as recommendations on the application of the methods of natural sciences and technical means in crime detection. They form the foundation of one of the branches of criminalistics, that is,

— criminalistic techniques;

— general tactical recommendations on the organisation and planning of investigation of crimes in typical situations;

— tactics and basic tactical operations carried out in the course of investigation of crimes which, combined with the tactical recommendations on the organisation and planning of the investigation, form another branch of criminalistics — investigation tactics;

— criminalistic characteristics of various types (groups) of crimes which are punishable under criminal law;

— methods for investigating specific types (groups) of crimes, or so-called "specific methods". The system of "specific methods" of investigation of crimes and their specific criminalistic characteristics forms a branch of criminalistics, i. e. the methods of investigating specific types (groups) of crimes.

Criminalistics is a legal science. On the one hand, this branch tends to apply natural and technical sciences and mostly through them expands its scientific and technical basis. On the other hand, criminalistic methods, means and tactics are used in the legal sphere, primarily in criminal procedure, and that is why it is closely associated with the science of criminal procedure, criminal law and criminology. It is an integral part of the system of legal sciences whose data are used in crime control.

The link between criminalistics and the sciences of criminal law and criminal procedure is basically established through the branches of law which are studied by these sciences. By formulating the material elements of the crime (the *corpus delicti*) and criminal responsibility for committing it in a criminal law, the law-maker defines thereby also the sphere of the application of criminalistic methods and means. The law of criminal procedure is the basis for the elaboration of tactics and methodology of criminal investigation and regulates the use of scientific and technical methods in this procedure. None of the methods or tactical means contradicting the law of criminal procedure can be used in the investigation and trial phases.

The close link between criminalistics and the science of criminal procedure is most visible in the theory of evidence. A typical feature of criminalistics and this theory is that they complement each other.

The theory of evidence and its core — the law of evidence — exert a substantial influence on the development of criminalistics, its scientific and technical methods and means, the tactics and methods of investigation. The theory of evidence and the improvement of the legal regulation of the use of criminalistic methods in criminal procedure contribute to the development of criminalistics and facilitate the use in court procedure of the achievements of scientific and technological progress and new tactics in crime detection. Thus, the improvement of criminalistic methods depends to a considerable extent on the level reached in the development of the theory of evidence.

In its turn, criminalistics exerts a substantial influence on the development of the theory and law of evidence. Its influence may be traced in the following main directions: elaboration of recommendations on the use of new methods of natural sciences and technical means for detecting, recording and examining material traces of a crime; study and generalisation of expert practices and the elaboration of new methods of expert research; elaboration, by summing up investigation practices, of efficient tactical methods and preparation of new investigation actions for their legal formalisation.

However, all this is not enough to relegate the theory of evidence to the subject-matter of criminalistics. Consequently criminalistics does not encompass either the trends observed in the emergence, collection, examination, appraisal and use of evidence. These are the province of the evidence theory, the science of criminal procedure. Even if we speak about the tendencies in the emergence of evidence as applied to exhibits, that is, the material traces of a crime and the mechanism of their formation, still we have to keep in mind that actual data on the crime become evidence exclusively when they are received from the sources stipulated by the law of procedure. The trends in the emergence of evidence cannot be divorced from their legal form.

In criminalistics it is generally assumed that the mechanism of the formation of traces is investigated by one of the branches of criminalistics — criminalistic techniques. However, this is true only when we deal with the traces left by simple interaction of material objects (handprints, footprints, tracks left by vehicles, typewritten texts, etc.). Still, when more intricate forms of interaction are dealt with, data supplied by criminalistics proper are not enough, and here we need knowledge in various fields of natural and technical sciences. For instance, some traces left by the instruments of burglary or the deformities resulting from vehicle collisions cannot be examined if the investigator does not know the theory of elasticity, the resistance of materials and other fields of mechanics. In examining typographic texts or those produced by various duplicating machines and printing stamps purely criminalistic knowledge is not enough. One has to be an expert in polygraphy. Whether forensic examination belongs to a particular "mother" science is determined by the theory and methodology of a particular examination rather than by the investigated object. One of the tasks of criminalistics is to adapt and apply the laws, theory and methods of natural, technical and social sciences for crime detection. This interpretation of the subject-matter and tasks of criminalistics does not detract from its scientific prestige and great practical value as an applied legal science.

It would be also wrong to assume that criminalistics is concerned with the institution of criminal proceedings, the subject-matter and the scope of proof. The institution of a criminal case and the object of proof are traditionally procedural problems which are outside the framework of criminalistics. Although criminalistics examines, among other aspects, the tactics of the initial actions by an investigator and a person instituting an inquiry at the stage of a criminal case being initiated, the very problem of institution is of a purely procedural nature and falls within the subject-matter of the science of criminal procedure.

While elaborating investigation theories and planning an investigation, criminalistics relies on the procedural concept of the object of proof, a typical conglomeration of circumstances to be established for a certain category of cases. It is impossible to plan an investigation if there are no definite limits set for the object of proof. However, it does not mean at all that the object of proof and limits for proof are a problem of criminalistics rather than procedure.

The correlation between criminalistics and criminology is characterised by the fact that criminalistics data are used for tackling criminological problems of crime prevention whereas criminology data are taken into account in elaborating criminalistic descriptions of crimes and "specific methods" of investigation. While in some countries, the Soviet Union included, criminology was yet to acquire scientific independence and failed to reach a proper level, some problems of criminology associated with crime prevention were examined within criminalistics. That is why it was pointed out in some definitions of criminalistics that criminology was also a crime-prevention science.

The relegation of crime prevention to the realm of criminalistics is sometimes explained by the fact that the law of criminal procedure, in the USSR in particular, makes it binding upon investigators to detect in the course of investigation of a particular crime the causes and conditions thereof and counsel enterprises, establishments and social organisations on the measures to be taken in order to eliminate these causes and conditions. However, the practical procedural activities of an investigator, including those connected with the identification of causes and conditions leading to crime, are an implementation of recommendations not only of criminalistics but also of criminal procedure, criminal law, criminology, forensic psychology, forensic medicine and other sciences which are indispensable for an investigator in the performance of his duties. Preventive activities are the realm of criminology and are based on its scientific recommendations. Criminalistic data are used in order to prevent transgressions of the law. As criminologists justly assert, criminalistics provides criminology with the material on the tactics and methods to be employed by investigators and the court so as to ascertain the causes and conditions of particular crimes. Criminalistics also elaborates technical means impeding the commission of crime. However, all this does not change the subject-matter of criminalistics and does not turn it into a science dealing with crime prevention problems.

Crime prevention involves not only the use of criminalistic data but also data supplied by other sources, such as criminal procedure, procurator's supervision, sociology, statistics, social psychology, pedagogics, forensic psychiatry, forensic medicine, etc. However, crime prevention problems do not determine the subject-matter of the sciences listed above. In this respect criminalistics is not an exception: it teaches crime detection methods and in this capacity serves criminal proceedings, operative-search activities and crime prevention.

Criminalistics Is Closely Linked also with Ethics and Forensic Psychology. Criminal investigation tactics and methods are based on legal and moral norms. Thus, ethics and, particularly, its special branch, judicial ethics, actively assist criminalistics in the elaboration of lawful and morally-acceptable methods of crime detection ensuring the establishment of the truth in criminal cases.

The development of criminalistics, the improvement of its methods and means are impossible without the use of knowledge in the field of psychology. Forensic psychology plays an especially important role in the development of crime detection tactics, in the improvement of tactical methods used in crime investigation proceedings. Knowledge about the peculiarities attending psychic processes, emotional states, the willpower, the character, the temperament and other traits of an individual which are displayed in committing a crime, as well as in criminal proceedings, allows to elaborate scientifically-substantiated criminalistic recommendations and improve tactics. A thorough elaboration of the psychological foundations of criminal investigation tactics is an important task facing criminalists and psychologists. However, its practical solution should not lead to a reciprocal intervention into the subject-matter of the science and obliterate boundaries between criminalistics and forensic psychology. These boundaries are sufficiently clear-cut: forensic psychology investigates the regularities of psychic phenomena manifesting themselves in certain criminal conditions, in court proceedings and in executing the sentence, while criminalistics is concerned with the elaboration of recommendations on the application of the data supplied by forensic psychology in criminal investigation and for improving criminalistic methods and tactics.

2. The System of Criminalistics

The system of a science to a considerable degree is determined by its subject-matter. From the above definition of the criminalistics' subject-matter it follows that the internal structure (system) of criminalistics comprises four clearly-defined branches (subsystems): criminalistic methodology, criminalistic techniques, investigation tactics and the methods of investigation of individual types (groups) of crimes.

Criminalistic Methodology. The methodology of a science includes not only the teaching on its methods but also the theory and the problems involved in the evolution of a particular branch of science in an historical aspect (the historical method of cognition).

The methodology of criminalistics includes, in particular, the scientific concept of its subject-matter and internal structure, the place criminalistics occupies in the system of scientific knowledge and its correlation with other related sciences. An important component of criminalistics is the teaching on the general scientific and special methods applied, the theory of identification and the teaching on criminalistic clues. Criminalistic methodology comprises the theory of cooperation between the investigator, the operative-search bodies and the public in crime detection, the history of criminalistics and other methodological problems.

Criminalistic Techniques. The term "criminalistic techniques" carries two meanings. First, this term is an inclusive notion comprising the methods of natural science and technical means employed in crime detection. Second, it denotes a branch (subsystem) of criminalistics which comprises scientific principles and recommendations regarding the application of the above methods and technical means in crime detection. This branch includes the foundations of criminalistic techniques, forensic photography, traceology, forensic ballistics, criminalistic investigation of writing, technical criminalistic examination of documents, the identification of people by their appearance and criminal registration.

Criminalistic techniques evolved and developed on the basis of the practical application in crime detection of the data derived from natural and technical sciences. Technical means initially used in criminal investigation were not systematised, were employed sporadically and did not comprise a system of scientific principles and recommendations to form a branch of scientific knowledge, that is, criminalistic techniques.

As science and technology developed and expanded the scope of scientific research, they began to be more extensively used in revealing, fixation and examining the material traces of crimes, and detective and investigative practices posed a scientific problem of elaborating methods and means which could be used to discover and study real evidence. That is how the traditional branches of criminalistic techniques evolved which have been preserved and further developed.

In crime control, the scientific generalisation of the application of the data supplied by anthropology, anatomy, anthropometry, the morphology of the skin texture of hands and feet, and other scientific data produced the methodology of verbal portrait, dactylography, and criminal recording.

Dactylography (the study of fingerprints) has rather quickly become a broader branch of criminalistic techniques, traceology, whose subject is not only fingerprints, palmprints and footprints but also tracks left by motor vehicles, instruments of burglary and other objects with a relatively stable form. This discipline is now also used in the examination of such objects as shot bullets, fired cartridges, printed texts. However, traceology methods alone did not suffice, since the mechanism of the formation of traces on shot bullets and fired cartridges, for instance, is very specific and complex and their examination required the expertise of military science, interior ballistics. This is how a new branch of criminalistic techniques has emerged — forensic ballistics.[1]

The development of optics and photochemistry introduced photography methods and techniques in crime detection. Special photographic methods and techniques were created for recording and examining criminalistic objects, and there emerged an independent branch of criminalistic techniques: forensic photography subdivided into forensic-operative and expert.

The theory of the prominent Russian scientist, Ivan Pavlov, on the higher nervous activity of man and his theory of the dynamic stereotype combined with psychology data served as a foundation for the elaboration of a science dealing with handwriting. A wide range of physical, chemical and technical methods and techniques was used to examine documents, and this approach gave rise to an independent branch of criminalistic techniques: technical criminalistic examination of documents.

At one time criminalistic techniques were identified with criminalistics as a whole. In a number of countries this attitude still persists. However, this perception of criminalistics does not correspond to the modern level of its development and overlooks the existence of its other branches, such as investigation tactics and the methodology used in the investigation of individual types (groups) of crimes.

Criminalistic techniques as a branch of criminalistics are designed to: study and scientifically generalise the practices associated with the application of data supplied by natural and technical sciences with the view of detecting crimes; uncover new opportunities provided by natural and technical sciences with the view of using or adaptating them in crime control;

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[1] Ballistics is the military-technical science concerned with missile propulsion and motion. It is subdivided into interior (or internal) ballistics dealing with the movement of the missile inside the barrel and exterior (or external) ballistics concerned with the motion of a missile after its expulsion from the barrel.

create, on this scientific-empirical basis, new criminalistic methods and techniques, and elaborate practical recommendations on the application of scientific and technological achievements in detecting, recording and examining material traces of crimes, and in crime prevention.

The study and scientific generalisation of investigation and expert practices is important for the development of criminalistic techniques. Crime control facilitates the search for new scientific methods of investigation and the elaboration of efficient expert methods. There were quite a few cases when scientists and experts modified the existing scientific methods of investigation or looked for, and created, new methods of expert examination. In this way criminalistic practices contribute to the search for new, unconventional methods in the investigation of criminalistic objects. This is how there emerge new criminalistic methods and means, new branches of criminalistic techniques. This is a slow but natural process. Criminalistic techniques, like criminalistics as a whole, should not be forever limited to their traditional branches (traceology, forensic ballistics, forensic photography, criminal registration, etc.), because their further development would be precluded in these conditions.

The development and improvement of criminalistic techniques involves not only the elaboration of new technical criminalistic methods but also the elaboration of recommendations on the way in which data supplied by natural and technical sciences should be used in crime detection. Therefore, the question arises about what these recommendations should be and to what extent they should reveal the scientific material of natural and technical sciences used for criminalistic purposes. If recommendations are relevant only to the essence of the methods applied in natural science (as they are when we speak of criminalistic methods of investigation as such) criminalistics would inevitably go beyond the framework of its subject-matter and intrude into the domain of natural and technical sciences. In this case we see the obliteration of the line separating criminalistics, on the one hand, and natural and technical sciences, on the other. Moreover, it would be impossible to distinguish between criminalistics and related sciences, used in criminal proceedings. For instance, forensic medicine and forensic psychiatry also draw up recommendations on the application of data provided by natural (medical) science in crime detection. However, they differ from criminalistic recommendations on the application of data supplied by forensic medicine and psychiatry and used to detect, record and investigate criminalistic objects. The latter recommendations do not contain any indications as regards the essence and content of medical methods proper which are the subject-matter of medical science.

Criminalistic recommendations on the application of data of natural and technical sciences in crime detection should indicate: the categories (groups) of criminal cases to which particular data obtained by natural and technical sciences can be applied; in the investigation of what criminalistic objects and the resolution of what particular problems they are used; what is the general methodology of their application in the process of expert examination, and in the conduct of investigatory and operative-search activities (the general methodology of identification investigations, for instance). As for the methods of natural and technical sciences as such, these methods are used in criminalistics ready-made, i. e. as they are represented in a corresponding "mother" science. Criminalistics cannot and should not be engaged in the elaboration of these methods.

The development and extensive introduction of criminalistic techniques in investigatory and operative-search activities makes it necessary to improve the forms of their application in crime detection. At present, criminalistic techniques and the latest achievements in natural and technical sciences are used in crime control as follows:

(1) conducting expert examinations on the basis of and in accordance with the law of criminal procedure (by the order of an investigator, a person engaged in inquest, or by court decision). This is the basic procedural form of using scientific and technical data in crime detection which relies on a wide network of state bodies engaged in conducting expert examinations;

(2) inviting specialists for providing scientific and technical assistance to the investigator and the inquest body in making arrangements for, and carrying out, investigation, detecting and recording material traces of a crime, establishing and appraising other circumstances relevant to a particular criminal case;

(3) employing criminalistic techniques by the investigator himself and the inquest body in their investigatory activities;

(4) directly using scientific and technical methods and means by operative-investigatory services.

Investigation Tactics. The term "tactics" as applied to investigation covers the sum-total of tactical means and methods used in order to attain the goal pursued by investigation, i. e.

a comprehensive, complete and impartial study of the circumstances of a criminal case and the establishment of the truth. In criminal proceedings and criminalistics this term implies the theory and practice of using tactical methods and means of investigation in a criminal case. Consequently, investigation tactics can be described as a branch (subsystem) of criminalistics engaged in elaborating tactics of investigatory activities and general tactical recommendations relevant to the organisation and planning of investigation.

Besides the general matters pertaining to the organisation and planning of investigation the tactics of investigation contains recommendations on preliminary arrangements for inspection, search, interrogation and other actions and tactical methods of their implementation provided for by the law of criminal procedure.

Of late, a new tactical method has been added to the body of investigation tactics: "a tactical operation" which is a system of activities and tactical methods employed in order to solve a more or less intricate tactical problem facing investigation. For instance, these "operations" may include a system of investigatory and operative-search activities and tactics used in order to expose a false alibi of an accused, identify a corpse, conduct a search simultaneously in several places in the same criminal case, etc.

A "tactical operation" goes beyond the bounds of a particular investigatory action or operative-search activity, and, consequently, is an independent category of investigation tactics. A "tactical operation" does not belong to the investigation methodology; it is not conditioned by particular features of the investigation of a specific category of crimes, and it is broader in its scope. In particular, tactical methods used to expose a false alibi are generally typical of all criminal cases regardless of the nature of the crime committed.

Investigation tactics is not limited to the tactics of inquest and preliminary investigation but is also tactics of court investigation. Despite the fact that court proceedings and court investigation, in particular, are governed in detail by the law of criminal procedure, investigation in each case involves many tactical problems which cannot be resolved by legal means, for the law-maker is in no position to foresee and take into account all specifics of criminal cases. Legal regulation does not address such matters of court investigation as the way in which evidence is examined; the sequence of questioning of defendants, victims, witnesses and experts; the way in which questions are put; and the investigation of concrete facts of crime in the course of interrogation; tactical specifics in the examination by the bench of the place, premises and real evidence relevant to those facts; specifics in the interrogation of juvenile witnesses and victims with due regard for the conditions of court proceedings, and many other factors. These tactical matters which are the domain of investigation tactics should be tackled while taking into account scientific recommendations.

Investigation tactics is developing hand-in-hand with the science of criminal procedure. This is explained by the fact that both deal with the inquest, preliminary and court investigation and investigatory activities provided for by the law of criminal procedure. However, their aspects and goals differ inasmuch as the science of criminal procedure deals with the legal rules governing the inquest, preliminary and court investigation, while investigation tactics is concerned with their tactical side.

Investigation tactics promotes the development of the law of criminal procedure and is instrumental in the improvement of the legal means of criminal procedure. The evolution of some tactical recommendations into mandatory procedural rules is a convincing proof of the positive contribution made by investigation tactics to the development of criminal procedure law.

Methodology for the Investigation of Individual Categories (Groups) of Crime. The investigation of crimes, i. e. their exposure in the procedural form, is carried out with the help of criminalistic methods and means.

The methodology applied as a branch (subsystem) of criminalistics contains law-based recommendations relating to the form of criminal procedure in which specific categories (groups) of crime should be detected. It incorporates a system of specific methodologies of the investigation of individual categories (groups) of crime. Each category (group) of crime has specific features of investigation, and the basic task of these methodologies is to reveal and formulate particular features of investigation as applied to individual categories (groups) of crime. It is relevant to universal scientific recommendations which are used in crime investigation with due regard for particular features of each criminal case.

In the USSR, crime investigation is governed by the unified principles of Soviet criminal procedure and is carried out in accordance with the general rules established for the preliminary stage of investigation. The legal proceedings established by the law of criminal procedure are common and mandatory in all criminal cases and for all courts, procurator's offices and bodies of preliminary inquest and investigation.

The stipulation formulated in Art. 1 of the Fundamentals of Criminal Procedure of the USSR and the Union Republics does not rule out substantial specific features typical of the methods applied in the investigation of each particular category (group) of crime.

The structure of the branch of criminalistics under examination contains the methodology used in the investigation of the crimes the perpetrators of which are punishable under criminal law. Specific methodologies are categorised according to the classification of crimes which is adopted in Soviet criminal law and comprise the methodology applied in the investigation of certain crimes committed against state; crimes committed against public property; against life, health, freedom and dignity of the individual; economic and occupational crimes, and so on.

Recently, some well-grounded proposals have been made that specific methodologies should also be classified on the basis of criminalistic characteristics of crimes. The similarity of criminalistic characteristics allows to establish individual groups of crimes whose investigation involves identical methods.

Basically, the structure of the specific methodologies of investigation should be unified and incorporate the following elements: the criminalistic features of a particular category (group) of crime; the elaboration of investigation theories in typical situations; the organisation and planning of investigations; the planning of investigatory activities and establishing of the sequence of their performance for checking crime theories. It should also include the selection of investigation tactics; the application of scientific and technical methods and means; the interaction between an investigator, detection services and the public in the investigation of a particular category (group) of crimes.

CHAPTER II

GENERAL SCIENTIFIC AND SPECIAL METHODS OF CRIMINALISTICS

1. General Scientific Methods Applied in Criminalistics

The method of science is the system of techniques of knowledge of regularities which are its subject-matter. It is common practice to identify the method of science not only with the system of methods used in cognition but also with an individual method (technique) of practical and theoretical activities, for instance, an analysis, synthesis, abstraction. In this sense "method", "technique" and "procedure" are applied as identical terms.

Distinction should be also drawn between the methods of scientific cognition and practical activities in a particular field. They should be neither identified nor counterposed, the more so because many methods of scientific cognition are simultaneously methods used in practical activities (experiment, comparison, etc.). Besides, practical activities, or practice, allow to check the credibility and reliability of scientifically elaborated methods contributing thereby to their further improvement. Practice is the criterion of the veracity of any theory, including that of knowledge. Thus, criminalistic methods are not only the methods used for scientific knowledge of the criminalistic mechanism and its trends but also its methods and techniques used in practical activities to detect crimes.

Methods of scientific knowledge differ in their content. They comprise groups at various levels depending on their application to the investigation of regularities. The most general laws governing the development of nature, society and thinking are cognised through dialectical and historical materialism. Its basis and evolution allow to elaborate methods of the next level which are applied in order to cognise regularities of all branches of sciences and are universal in their essence. These are universal scientific methods of knowledge. Finally, the theory of knowledge identifies a group of the most numerous and diverse (special) methods of particular branches of science (spectral analysis, electronic microscopy, chromotography), which have a more limited scope of application but are equally important for the development of science. Criminalistics has an extensive stock of special methods but also resorts to universal scientific methods, to say nothing of the science dealing with the regularities of knowledge: dialectical logic.

The methodological importance of dialectical logic in the development of criminalistics lies in the fact that it serves as a philosophical foundation for the elaboration of criminalistic methods and theories which substantiate the latter.

For criminalistics of great methodological significance are the tenets of formal logic, a science of the forms of thinking, whose laws, methods and operations relate to the content of dialectical logic and are part and parcel of the universal method of knowledge. They make the greatest methodological impact on the elaboration and practical application of methods (techniques) of investigation tactics, particularly the methods used in organising and planning crime investigation. Thus, criminalistics applies the logical laws of identity, contradiction and the excluded third, and such methods of logical cognition as analysis and synthesis, induction and deduction, analogy and hypothesis, generalisation, systematisation and classification. It also employs various forms of abstract thinking: concept judgement, conclusion, problem, idea, theory, etc. They play a significant role not only in dealing with the methodological problems of criminalistics but also in the creation of its own specific methods and the elaboration of recommendations on the application of universal scientific methods of knowledge in criminalistics. For instance, the hypothetical method of knowledge with the use of criminalistic theories, i. e. the method of logical modelling, extensively applied in criminalistics, is based on the principles of formal logic which establish the concept of hypothesis, stages of its development, the rules for structuring and verifying, as well as conditions for its veracity.

Systems methods of investigation (structural and functional) are used in scientific knowledge, including the sphere of criminalistics. The essence of the systems method boils down to the following: the object is investigated not only by its composition as a system of components but also as a component of a certain system. It plays this part through numerous and diverse structural and functional links which are also subjected to a comprehensive investigation. The systems approach used in criminalistics ensures a profound and comprehensive knowledge of its regularities. The structural and functional systems methods are also reflected in the methods of practical crime detection elaborated by criminalistics.

Universal scientific methods of knowledge include: observation, measurement, description, comparison, experiment, modelling, identification, mathematic methods, etc. As science develops new methods emerge which, being the product of a particular branch, subsequently acquire universal scientific nature. Thus, mathematic methods and, in particular, statistical methods of probability, which owe their origin to mathematics, have acquired universal scientific import to be applied nowadays in many other branches of scientific knowledge, including criminalistics.

The application of universally adopted methods of knowledge in various branches of science has its peculiarities determined by the object, goals and specific conditions of investigation. For instance, the experimental method applied in criminalistics and that in nuclear physics differ not only in the object and goals of investigation but also in the conditions in which they are carried out. The conduct of an investigation experiment stipulated by the law substantially differs from the experimental method applied in any other field of theory and practice.

Observation as a systematic purposeful direct perception of an object or a phenomenon is extensively applied both for scientific and practical aims: in the study and scientific generalisation of law-enforcement practices, expert examinations, investigation, operative-search activities, etc. It can be performed by two methods: visual and with the aid of technical instruments (microscopes and other optical instruments, electronics, electronic optical transformers (EOT), X-ray apparatuses, means of ultrasonic probing, laser technology, etc.). In modern scientific research in the field of criminalistics, as well as in investigation, expert and operative-search practices observation with the help of technical means prevails.

Measurement is a method for knowing various space and time magnitudes. Space and time are forms of the existence of matter. That is why the knowledge of matter, laws of nature, society and thinking is impossible without quantitative and qualitative characteristics of these forms. In criminalistics the measurement of space and time magnitudes and their correlation is of cardinal importance. Both in scientific research and in practical investigation of traces of crime one cannot do without measuring linear and angular magnitudes, the volume, temperature, strength, elasticity, resistance of materials, optical properties, etc.. Nor can one do without measuring in order to determine various time indicators such as the longevity of a particular phenomenon, the speed of movement, the time expired since traces were left, etc. The accuracy of measurements in criminalistics is one of the major conditions for establishing the truth in a criminal case. Of course, the traditional ruler, the protractor and sliding callipers are still in use by the investigator. However, modern expert methodologies require the use of other, particularly sensitive, accurate and reliable measuring instruments capable of registering space and time changes not only at the molecular level but also at the level of elementary particles.

Description. In criminalistics, as in other sciences, recording by description of quantitative and qualitative indicators of investigated objects and phenomena is a necessary condition for knowing their essence. Theoretical knowledge is impossible without description. As a method of knowledge description must be the systems method as is the approach to the study of the reality. Description reflects the interrelation between objects and the real phenomena. This explains the great importance of various criminalistic classifications relating to physical features of persons, palmprints, fingerprints, footprints, tracks left by transport vehicles and other traces, firearms, cartridges, bullets, handwriting, written expressions, etc. At present, additional criminalistic classifications are being elaborated which relate to crimes, investigation situations, etc., and this positively affects the effort in crime control.

Description can be verbal or recorded by various means, for instance, a written description of criminalistically-significant objects in procedural acts, card indexes, catalogues, photo albums, description with the help of sound-recording equipment.

The method of description applied in the crime-detection practice has its specifics determined by the law-prescribed procedural form of recording the results of knowledge.

Comparison is used on a wide scale in criminalistic identification. Defying correlation, sharply different objects and phenomena, and their characteristic features, can be easily differentiated by visual methods. However, the visual comparison alone, without the use of special scientific and technical means, is not sufficient if the identification problems associated with the objects closely resembling each other are to be tackled.

The use of various optical instruments, special comparison microscopes, photographic, chromotographic, electronic-optical, spectro-photometric and other methods for identification and contrasting purposes render the method of comparison more effective.

Experiment is also extensively used in criminalistics and court proceedings; moreover, recently it has acquired a new, legal form of the investigation experiment previously unknown in legal practices.

A scientific experiment and investigatory one differ substantially but their basic, essential features are similar: each must be carried out in certain, prearranged conditions; the results of the experiment are considered reliabel if they remain unchanged after a repeated and consecutive change in experimental conditions.

The experimental method is also applied in expert examination and is called an expert experiment. A partial case of the use of the experimental method is its application by an investigator or an expert in obtaining comparative samples for identification research.

The success of an experiment is ensured by its thorough preparation and the creation of necessary preliminary conditions.

Modelling stems from natural and technical sciences as a method of verification on the models of the adequacy of the projected technological facilities, installations, aggregates and machines, as a method of cognising astronomic, meteorological, biological and other physical phenomena and processes. Later this method began to be used in social sciences and the humanities, thus acquiring the status of a universal scientific method of knowledge. It is successfully used in criminalistics, particularly in planning investigations and carrying out investigatory activities (examination of the place of the event, the search, the verification of evidence on the spot, the investigation experiment, etc.).

The model as an approximate copy imitating the real object or a phenomenon is used in the process of cognition in those cases when there is no sufficient information on a particular object or phenomenon. A model built on the basis of such information, while being always inferior to the original, helps "to see" what elements of the picture are lacking and, consequently, understand what elements should be added to it or improved in order to make a model an exact copy of the investigated object.

Models can be physical (material), for instance, a plaster copy of shoeprints, a plan of the place where an event occurred, a copy of a building. They can be logical (ideal), an investigation theory, for instance; structural, reproducing the interior structure of an object; and functional (dynamic), copying the original object in motion, for instance a model of a technological process, an investigation theory, etc.

In criminalistics all types of models are used, but hypothetical cognition or logical modelling is of special importance in crime detection as are investigatory and operative-search theories (models) in planning investigations and operative-search activities.

The method of identification is used when it is necessary to establish whether a particular object or phenomenon is the same or define a classification group to which it belongs. In natural and technical sciences this method is most often resorted to in order to establish a group classification of particular objects and phenomena, while in criminalistics the primary role is played by individual identification since the problem of identity is mostly resolved with regard to concrete exhibits, executors and authors of documents, and specific objects which left particular traces.

The practice of identification investigations in the sphere of criminal proceedings has set criminalistics the task of further developing and improving the identification method. Criminalistics has produced a modern theory of identification, created and assimilated efficient scientific methods applied for tackling various identification tasks in traceology, in forensic ballistics, in identifying persons by their handwriting, in technical criminalistic investigation of documents, in the identification of persons by their appearance and in forensic photography.

Mathematical methods are used for an objective assessment of identification marks in order to ensure the reliability and trustworthiness of expert conclusions. To this end there have been introduced mathematical statistics, the theory of probability and modern computer technology. The mathematically-established quantitative characteristic of identification marks in handwriting, dactyloscopy, photo portrait and other types of forensic examination has greatly enhanced the reliability and trustworthiness of expert assessments and reduced to a minimum the negative influence of subjective factors on expert conclusions. Mathematics has made for the introduction of modern computer methods in criminalistics, autotechnical and other types of forensic examination. It has prepared conditions for the development with the help of these methods of criminalistic forecasting and the creation of models of typical investigation situations and optimal solutions to practical tasks in crime detection.

The general methods of knowledge are always used in a complex. Thus, the application of the comparison method is unthinkable without observation and description while systematisation and classification are impossible without comparison; an experiment, observation and comparison always complement each other while the method of measurements is inseparable from mathematical methods.

2. Special Methods of Criminalistics

Criminalistics most extensively exploys its own special methods which can be subdivided into two groups: criminalistic methods as such and methods of natural and technical sciences mostly applied in criminalistic examinations.

Criminalistic methods as such have been developed and substantiated by the theory of criminalistics or borrowed and transformed (adapted) by it specifically for the investigation of criminalistic objects (forensic-photographic, traceological, forensic-ballistic, etc.). For instance, in forensic photography there have been developed such methods as identification, measuring, panoramic, stereoscopic, microscopic, large-scale and other methods of photography, photographic intensification of brightness and colour contrasts, phototechnical expert examination, the identification of a photomontage (composite photography), in particular, the identification of photocameras, photographic enlargers, masking frames, photocopying machines and other photoinstruments by photomaterials (negatives, positives, etc.).

In traceology there have been developed various methods for copying traces, microscopic and profilographic examination of the microrelief of the traces left by the instruments during a burglary and other kinds of traces, fingerprint identification, etc.

Forensic ballistics has its own methods for uncovering and fixing the traces of a shot, the identification of firearms by fired cartridges and bullets, the distance from which a weapon was fired and direction of a shot and the time when a bullet was fired, as well as the sequence of several shots.

Criminalistics also has at its disposal various efficient methods for the technical criminalistic examination of documents, for the forensic examination of handwriting, for the identification of a person by means of photorobot, for discovering and examining various microparticles, and for criminal registration.

Besides the methods and means of criminalistic techniques wide use is also made of the methods of investigation tactics and the methodology of crime investigation. They include, in particular, the methods of planning investigations, analysing investigation situations, and tactical methods of carrying out investigatory activities.

The basic source for the formation of criminalistic methods and means are natural, technical and social sciences, as well as investigation, court and expert practices. The methods of scientific generalisation of these practices (questionnaires, etc.) are also among special methods employed by criminalistics.

Methods of natural and technical sciences are quite extensively used in the examination of criminalistic objects. These include various physical methods (spectral analysis, examination in infrared rays and with the use of isotopes, etc.), the methods of qualitative and quantitative microanalysis, biological, botanical, mineralogical, soil-science and many others.

A successful detection of crime largely depends on a full and efficient use of modern achievements of natural and technical sciences.

All criminalistic methods recommended for the use in crime detection and particularly in criminal procedure must correspond to the requirements of scientific groundlessness and reliability; they should also be lawful and morally impeccable. That is why in judicial procedure it is inadmissible to resort to any methods which are still at the stage of elaboration and testing, as well as to various unscientific and morally-inadmissible methods, for instance drugs, hypnosis, etc.

CHAPTER III

CRIMINALISTIC IDENTIFICATION

1. The Concept and Scientific Principles

Identification is the process of establishing the identity of an individually determined object or classification group[1] to which the object under examination belongs.

The process of investigation often demands the solution of various tasks of identification, such as establishing if this particular object left traces at the scene of an event, if the bullet extracted from the body was fired from the given pistol, if the fragments which were found at the scene used to be a single whole, and to what classification group does the object used as an instrument of the crime belong, what is its origin, etc.

The doctrine of dialectical identity recognises the individual character of objects of the material world. Man himself, and all that surrounds him, is strictly individual and unique. Despite the great degree of similarity between some objects (two drops of water, two fingerprints of one and the same finger of a hand, two cartridge cases, shot from one and the same pistol, etc.), each object of the material world is individual.

Individuality of an object means, on the one hand, identity to itself and, on the other, its distinction in respect to others. Thus, it would be wrong to speak of identity of several objects, for example, the identity of objects belonging to one and the same classification group, of the identity of the part and the whole, the reflection and the object reflected. The object is identical only to itself.

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[1] By the classification groups we have in mind not only universal (general) classification groups adopted in a particular branch of science (species, families, classes, types, etc.), but special (particular) classification groups identified in various spheres of practical work by means of standards (for example, groups of industrial products of a definite grade, mark, model, date of manufacturing, etc.).

But identity, sameness of the object to itself cannot be rigidly permanent. It is always being modified under the impact of the changes taking place. Hence identity contains in itself differences. Every object is subjected continuously to mechanical, physical and chemical influences which change and modify its identity.

Changes in the identity of an object may be differentiated by their character and intensity. Substantial qualitative changes in the object produce a qualitatively new object, new identity. This is particularly important for the theory and practice of identificational expert examination. The investigator and expert in every case of identification must reveal and analyse, besides the attributes of similarity, those that differ, correctly evaluate them, take measures to preserve the objects for expert examination, so that from the moment of finding the object—real evidence—to the findings of the expert investigation they did not undergo such changes which would make identification more difficult or altogether impossible.

2. Types of Criminalistic Identification

All identificational investigations are subdivided into types obeying to certain patterns.

Thus, according to an identity to be established, one should differentiate between *individual* identification solving the question of identity of the individually-definite object and the *group*, which identifies the classification group to which the object under examination belongs and establish its group affiliation.

In these types of identification, the identity rather than similarity, is established. Of course, objects belonging to one and the same classification group, have similarities among them by the identificational marks characterising the given group, though similarity may be also observed among objects of different groups. Therefore, the conclusion concerning the group to which the object under investigation belongs demands the establishment of the identity of a definite classification group to which it belongs, or the absence of identity, if the objects to be examined are ranked among different groups.

Clear-cut differentiation of individual and group identification is, above all, necessary for establishing proof.

The significance of group identification should not be underestimated. Undoubtedly, the establishment of the concrete object in the process of identification is more significant in criminal matters than the establishment of a group to which the given object belongs. But to say that in all cases group identification plays a less important role in the furnishing of evidence in court, than the individual, would not be correct. As a rule, the negative inference of the expert in the course of the group identification has no less significance for producing proof than the findings concerning the identity of a definite object. For example, if the expert came to the conclusion that the bullet extracted from the dead body was fired from a Mauser, then it follows that the suspected Browning has no relationship to the given shot. This confirms the conclusion that group identification helps narrow the circle of the objects checked and more purposefully and successfully conduct the search for the concrete object connected with a case.

Group identification in many investigations is the first necessary stage in the establishment of individual identity. As a rule, experts begin investigation of the object with analysing the general identification marks determining a classification group it belongs to. The investigation is discontinued if the object to be checked and the object sought for belong to a different classification group. This saves time and optimises the rate of investigation.

The proof value of the results of group identification is reverse to the quantity of objects included into the identified classification group: the narrower the group, the more valuable the conclusion as to which group the object under investigation belongs. Therefore, both the investigator and expert direct their efforts to narrow to the maximum the classification group to which the object under investigation belongs, determine the true source of its origin, for example, to determine not only the batch of the goods produced by the given enterprise but the shop, concrete machine, day of its output, the working shift and, if possible, the direct producer.

According to the *nature of the objects* to be identified, the following can be distinguished: identification by the *mental image* preserved in the person's memory (recognition), by the *materially-fixed reflection* of the object and also the *identification of the whole by its parts*. This differentiation is needed to reveal differences in the methods of identification while adhering to the general premises of the theory of criminalistic identification.

In the course of *mental image identification*, it is necessary to consider the regularities and conditions of perception of the object, the characteristics of memory of the identifying person, to create the favourable conditions for presenting the object for recognition, to consider the peculiarities of reproducing the mental image and other psychological factors.

Other peculiarities characterise the *identification based on materially-fixed reflections and identification of the whole by its parts.* Mainly employed here are expert methods of investigation, greater attention is given to the analysis of the mechanism of formation of the materially-fixed reflections, comparison samples are used and separate and comparison analyses of identifying and identified objects are carried out. The identification of the whole on the basis of its parts, presupposes not only the analysis of the traces or signs of dividing the whole into parts (traces of breaks, cuts, etc.) but the analysis of the structure, and also the composition of matter (material) of the analysed parts.

According to the *subject of identification* the *investigational identification* and *expert identification* are differentiated. If the identification does not demand special knowledge, it is conducted by the investigator himself or an inquirer by presenting articles or the person for identification or by direct comparison of objects observed in the course of inspection, search and seizure, with the available description of them and also identification under interrogation and confrontation, when the investigator identifies the person being questioned by his passport or other documents or identifies the person by description given by the persons under interrogation. This type of identification includes the identification of objects carried out by detectives in the process of their operative-search activity and also through the court in the investigations in court.

The investigator, or the inquirer, or the expert (as conferred by the court) carries out expert criminalistic identification.

If the *object of the investigation* serves as the basis of classification, identification is subdivided along the lines of *identification of persons, identification of objects and articles and identification of animals.*

Depending on *the sphere of criminalisic technology* to which the *investigated object* belongs, identification can be *photo-technical* (for example, group identification of photographs, identification of the photo camera on the basis of the developed films), *traceological, dactyloscopic, forensic ballistics, graphological, technical-criminalistic* identification of implements of writing, typewriters, of print and stamps, documents and *identification of the person by appearance*. Each of this type of identification has its task and specific method of investigation.

3. Objects of Criminalistic Identification

In the process of identification investigation, besides the objects, identification of which is being established, there are other objects with different identificational roles. Among these can be objects with traces of other objects, separate parts earlier composing one whole, tests (samples) of verified objects etc. It is important to correctly determine the identification role of these objects and to classify them by groups.

The first group of objects, participants in identification, involves the identified objects or those searched for [1], the establishment of the identity of which is the aim of identification. Such objects can be articles (pistol, implements employed in breaking in, typewriter, etc.) and the person.

To the second group belong the identifying objects which help establish the identity of the sought for object. This can be a materially-fixed representation of a particular object (for example, footprints in the ground, imprint of papillary pattern, handwritten or typewritten text, a fired cartridge or bullet, traces of the break-in instrument) and also separate parts earlier composing one whole (in particular, fragments of automobile headlights, parts of torn documents, fragments of a knife) or this or that object as a representative of the classification group.

The principle of differentiation between the identified and identifying objects consists in the direction of reflection of marks from the identified object to the identifying one, established by the analysis of elementary reflecting act and the role of objects involved as sources and carriers of identification information.

One should have in mind that any article (for example, material evidence) may have several different fields of identification [2].

Thus, in the search of a suspect in the burglary of goods, an axe was found by means of which, according to trace experts, the robbery of the storehouse was accomplished. On the blade of the axe fingerprints were observed. Dactyloscopists were able to establish that these were left by the suspect. In that case, the axe in the tracing identification played the role of the identified object. It was identified with the help of the identifying object (cutting traces) which had a tracing identification field sufficient for identification. That same axe with a dactyloscopic identification field was used to establish the other object of identification — the person who left fingerprints on the axe.

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[1] The unknown object is understood as being identified, though not established, and being sought for. The term "sought for" reveals this and stresses the necessity to verify whether the identified object is among those to be verified.

[2] *Identification field* or the totality of identificational marks reflected on the object under concrete conditions of interaction.

In the course of investigation of the typewritten text to identify the typewriter and the typist, the identifying object (the typewritten text) also has two different identification fields: characteristic features of type and the typewriter by means of which the latter can be identified and those which in their totality can lead to the identification of the concrete person who typed the text.

Identification is not possible without the identifying object. The necessary prerequisite of identification is the interaction of objects, the reflection of the qualities of the identified in the identifying object. Thus, in the case of identification there are the identified as well as the identifying object.

In cases when by the time of investigation the object to be identified has not yet been found, the task of the expert consists in establishing, through the particulars reflected on the identifying object, more or less detailed characteristics of the identified object which would make it possible for the investigator to find it.

The group of identifying objects includes the mental image of the object preserved in the memory of the person: it should be complete and clear, possess the sufficient totality of characteristic features by means of which it would be possible to identify the object sought for. If the mental image (and also the materially-fixed reflection) with the help of which it is intended to establish the presence or absence of identity of a definite object or a definite classification group, does not possess all that is necessary for identification, then such an image (reflection) cannot fulfil the role of the identifying object. In such cases identification is impossible.

The identifying object is necessary for all types of criminalistic identification. The role of the identifying objects in group identification is played by objects composing the given classification group and having the corresponding complex of marks. Comparison of the characteristic features of the object under investigation with those of the identifying one, that is, any object regarded as included into the classification group to be identified, makes it possible to decide to which group it belongs.

Samples for comparison are also used in the process of identification investigation. They are not obligatory in all cases of identification and are required only when direct comparison of the object under investigation is impossible or very difficult. For example, when detecting the writer of the manuscript analysed, it is impossible without comparative samples to compare identification marks represented in the manuscript, with the handwriting (system of movements in writing) of the writer. For that, comparison samples of the handwriting of the persons to be verified is necessary. In identifying the rifled weapon by the fired bullet, it is very difficult to directly compare the microrelief of the channel of the gun's barrel under identification and the microrelief of the surface of the cylinder of the fired bullet. In order to make the investigation easier it is necessary to have samples for comparison, i. e. bullets fired from the gun which would mediate the comparison of the analysed bullet's surface and the surface of the barrel's channel.

In identifying the whole by its components, when direct comparison of the components along the lines of their division is possible, comparison samples are not necessary.

In cases of group identification of materials, when it is necessary, samples of analysed materials (fuel, soil, grain, etc.) are taken for comparison.

Comparison samples must satisfy definite requirements: first, there must be no doubt as to their origin from the objects being examined, second, they must represent sufficient volume of their properties and third, they must be comparable to the identifying objects. The absence of even one of these requirements excludes the possibility of using the object as a sample of comparison. The failure of the sample of comparison to match the identifying object, may stem from the differences in the mechanism and time of their origination, and other factors. Consequently in each case of identification, the sufficiency and suitability of the samples of comparison, is decided.

Comparative samples are subdivided into two groups: free and experimental.

Free samples are objects outside the given criminal case, their appearance relates normally to the period preceding the commission of the transgression (for example, the letters of the suspect sent by him at the time to a particular office). The seizure, search and inspection may be a procedural form of obtaining free comparative samples.

Experimental samples are objects whose origin is associated with the purpose and conduct of an identification examination. They are obtained for the purpose of a comparative analysis from an accused or a defendant, from a witness or a victim.

Tactical and technical methods of obtaining experimental comparative samples play an important role. These methods and techniques differ depending on the type of identification but in all cases their aim is to reproduce to the maximum extent marks of the examined objects in comparative samples in order to reduce to the minimum an intentional distortion of identification marks by a person on whom a check is run (for instance in obtaining comparative handwriting samples).

Quite often in order to conduct identification research it is necessary to have several experimental comparative samples obtained from the same person checked in different conditions (several texts written by one and the same person using various instruments of writing and in different positions of that person, etc., several prints obtained by various degree of pressure, several texts typed on the same typewriter before the type was cleansed and after, with copying ribbon and without).

As a rule, experimental samples are obtained by an investigator. When necessary, for instance when special knowledge is required to operate technological means in order to obtain samples, he engages the services of a corresponding specialist. If it is necessary to resort to special methods to obtain comparative samples (for instance, to obtain fired cartridges by bullet catchers), such actions are performed by an expert and in the stipulated cases the obtainment of experimental samples is an element of expert examination. In that case an investigator has to submit not only the examined object to an expert (a gun, for example) but, as far as it is possible, the corresponding material for obtaining samples (bullets taken from a suspect, etc.).

Objects to be checked are an individual group of identification objects. In crime detection the identification of a criminal, the search for the instruments of the crime and other real evidence are usually linked with the checking of other objects similar to the one which is being identified. They compose a group of objects to be checked among which the object being identified is subsequently found.

The object being checked is present in each identification session, since there exist sufficient grounds to believe that it is exactly the object being looked for (identified) and the identity of which has to be established. Each object to be identified is considered as being checked until the process of identification is completed. However, if there is no needed object among the objects being checked, efforts are to be made in order to find and investigate other objects to be checked.

In the selection of objects to be checked the task of an investigator is to reduce to the minimum their range by logically excluding from it those similar objects among which the needed object is not to be found.

4. The Concept and Classification of Identification Marks

Expert conclusions on the identity of an object are always based on the sum total of its identification marks.

An identification mark is a property of an object meeting certain requirements. The criterion by which a particular property is relegated to a group of identification marks does not lie in the generic characteristic of its properties. Rather, it lies in the degree of their reflection on the identifying object, their specific features, relative stability, the lack of correlation (relative independence), the frequency of being encountered, the identification significance and the accessibility for practical cognition.

An object submitted for identification can be selected from among a multitude of similar objects by the sum total of its characteristic properties. To this end any properties can be used: specific features of the exterior and the internal structure of an object, its mechanical, physical and chemical properties, biological, anatomic and physiological peculiarities, etc. However, each of the above-listed properties can be used for the purposes of identification and perform the role of an identification mark only if it meets the said criteria.

The property of an object being identified should be reflected in the identifying object since, as it has been already mentioned, the identity of a needed object is being established by means of this object. If, for instance, the microrelief of trace-forming object is not reflected to a sufficient degree on the trace-receiving object, in that case there are no identification marks and the identification becomes unfeasible.

The role of identification marks can be played exclusively by the specific properties of an object. Here is an example.

An expert examining the handwriting of a person who has drawn a document notices written features which somewhat differ from the accepted in customary writing, i. e. they are specific, peculiar. The signs made in imitation of a typical writing are of no practical interest since they are of little value to the expert. The more peculiar is a property, the higher is its identification significance.

A relative stability is also an important characteristic of an identification mark. If a particular property of an object lacks stability it cannot be used as an identification mark and cannot be included in the identification process. Its insignificant variableness in time within the bounds of the identification period and the regular reproduction of its reflections on the identifying object, etc. can serve as an indicator of its relative stability.

The reciprocal independence of the properties of an object is an essential criterion in the selection of the marks needed for an expert's conclusion. As it is known, the properties of an object and, consequently, its identification marks can be correlated and the extent of this correlation can fluctuate. Sometimes the emergence of one mark in all cases prompts the emergence of another. Such marks with a high coefficient of correlation (reciprocal dependence) are unsuitable for identification purposes. So, if an expert detects such correlation of several marks only one of them is included in the sum total. The rest of them are discarded as having no independent identification significance. For instance, a high degree of correlation has been found in papillary patterns of the fingers between the loop, arch and whorl forms of a print in its central part and the pattern of two deltas. There exists a dependence with a high correlation coefficient also between individual graphic peculiarities of various written signs in shorthand texts.

If the correlation coefficient is low and the interdependence of the marks is insignificant, all of them are included in the found sum total and the identification significance of their sum total is determined taking into account the correlation coefficient. It should be noted that the correlation of identification marks can be overt and covert. The exposing and examination of the covert correlation can be made only by specialists.

An important characteristic of an identification mark is the frequency of its presence in similar objects and, consequently, its identification significance: the less often the mark occurs, the higher is its identification significance. Naturally, a mark frequently met in similar objects bears a certain identification significance. However, it is, as a rule, ignored in expert examination since its role in the formation of an identification conclusion is negligible.

The frequency and identification significance of marks in various types of identification research is established by the theory of probability and mathematical statistics. The mathematic interpretation of identification marks is a promising trend in the search for objective criteria in evaluating the minimum unique sum total of the marks which would suffice for an unqualified conclusion as regards the identity.

A property of an object can be used as an identification mark on condition that it is accessible for practical cognition. Not all natural phenomena discovered by science can be investigated by resorting to the modern methods of research. The absence of reliable scientifically substantiated methods of research into particular properties impedes their use as identification marks.

By the role they play in the field of identification these marks can be subdivided into general and specific.

General identification marks reflect particular properties specific for a certain classification group and serve as indicators for a group characteristic of objects (for instance, the type of the papillary pattern, the length of a footwear sole, the calibre of a gun, the number of the rifling lands of its barrel, the weight of a bullet, the pitch of the main mechanism of a typewriter, the chemical composition of the paper filler, the grade and type of cloth, the percentage of shot components, the method of its production, etc.).

Specific identification marks are characteristic features of an object which do not reflect its group properties. Specific marks include, in particular, peculiarities of the microrelief of the rifling lands of a gun barrel, "eyes", "islands", "bridges" and other peculiarities of the papillary patterns, various defects in the print of a typewriter, peculiarities in the structuring of written letters and their elements in a manuscript, etc. The indicator of the identification significance of a specific mark, along with the qualitative criteria, is the frequency of its repetition in similar objects which is a quantitative criterion.

A complex of marks incorporating both general and specific marks is always taken into account in carrying out identification. Distinction is made between a group complex of identification marks specific for all representatives of a certain group of objects and an individual complex characteristic of only one object.

The identification significance of a group complex of marks is determined by the volume of the group of objects which can be singled out with its help in a given classification system. The narrower a classification group singled out on the basis of a particular group complex of marks, the higher is its identification significance. For instance, the sum total of marks characterising all guns with the addition of such mark as the calibre of 7.62 mm allows to single out a group of guns which will include all "TT" guns. If we use as an additional mark the shape of trigger mark on the primer of a fired cartridge, we shall be able to select a narrower classification group of "TT" guns with a pear-shaped trigger mark, the guns which had been produced before 1948, or a round mark made by the guns manufactured later on.

5. General Methods of Expert Identification Examination

Each type of forensic examination, including identification, has its own methods of investigation: in traceology identification some methods are used, in forensic ballistics and the handwriting examination — other methods, etc. At the same time these methods have some common features.

Identification examination is characterised by a systems approach to the analysis of the phenomena stemming from their correlation and interdependence. In the identification cognitive process use is made of the laws and categories of formal logic, analysis, synthesis, inductive and deductive conclusions. The common methodological approach to identification requires a comprehensive and exhaustive examination of objects and scientifically substantiated and technically flawless working methods of examination. It also implies the spacing of an examination by certain stages with a strict observance of their sequence.

There are four stages of identification examination: an expert examination of submitted objects; separate examination; comparative examination; appraisal of the established sum total of marks and the formulation of expert conclusions.

Expert examination of objects is a necessary initial stage of any identification examination. In the course of an examination an expert first of all ascertains whether all materials listed in a decision (judgement) on conducting an examination have been submitted to an expert, whether all of them have been correctly registered from a legal point of view and whether there are any doubts in respect of their authenticity. Besides, the expert determines whether the objects are fit for identification. If the submitted materials are obviously insufficient or unfit for identification, he reports this fact to an investigator (court) and stipulates what supplementary materials have to be examined.

At the stage of an expert examination a plan of a future investigation is drawn up and the working methods which will be used are defined.

Separate examination of objects involved in the process of identification bears an essential significance, too. A disregard for this identification stage and a premature transition to a comparative examination can lead to erroneous conclusions. In this case an expert starts immediately from the comparison of submitted objects and concentrates all his attention on a striking, not infrequently incidental coincidence of marks, while leaving unnoticed less pronounced but essential differences, and due to this psychological trend, makes a mistake in his conclusion. In order to avoid this it is recommended to initially examine the submitted objects separately.

The basic goal of a separate examination is to establish a maximum quantity of identification marks representative of any object. In the analysis of the traces left by an object submitted to identification it is necessary to comprehend the mechanism of the formation of these traces.

Methods and technical means applied in the examination of identification marks must correspond to a particular type of an identification examination.

If necessary, the identified marks must be sufficiently and comprehensively recorded to be clearly visible on photographs, in tables and diagrams in order to facilitate the comparison of such marks at the stage of a comparative examination and correctly assess them.

When a separate examination of objects is completed and their representative complexes of identification marks are established, an expert goes over to a *comparative examination*. At this stage he compares similar identification marks of objects in tackling the basic task of a comparative investigation: to establish the coinciding and differing marks. In any case, whether there exists an identity or it is lacking there are both coinciding and differing marks, for, as was already mentioned, a dialectical identity contains changes in itself, while differing objects always have some similar elements.

A comparative examination must be comprehensive and detailed when not only the striking and most characteristic marks are compared in detail but also all identification marks revealed at the stage of a separate investigation irrespective of their number and the degree of manifestation. Sometimes it is the comparison of exactly small, imperceptible peculiarities that allows an expert to draw a correct conclusion.

The results of a comparison depend to a considerable degree on the application of technical means and methods of investigation. In the process of a comparative examination there can be used various technical means such as measuring instruments, magnifying glasses, comparison microscopes, special lighting appliances, etc.

Appraisal of the revealed sum total of marks and the formulation of expert conclusions are the final stage of an identification examination. As regards the sum total of coinciding or differing marks revealed by an expert, the latter must first of all decide whether they were logical or accidental. If the sum total of coinciding marks is logical, an expert's conclusion as regards their identity will be positive, while the legitimacy of the sum total of differing marks provides him with a negative conclusion in respect of their identity. Second, the revealed sum total of the marks is appraised from the point of view of its individuality, uniqueness and sufficiency for the substantiation of an unqualified conclusion, whether positive or negative.

Before one supplies a general estimation of the sum totals of coinciding or differing marks it is necessary to appraise each identification mark separately, taking into account its specificity, relative stability, reciprocal independence, frequency and identification significance.

If an expert draws a positive conclusion and holds that the revealed differing marks are accidental and are of no significance in resolving the problem of identity, he must substantiate it and explain what the given marks are determined by, for instance, show that some differences in the marks discovered in the manuscripts written by the same person are due to the divergence of writing conditions (the difference in the instruments of writing, the psychic and physical condition of the writer, etc.).

Subsequently, on the basis of an appraisal of identification marks, an estimation is made of their sum total representative of a particular object of identification. The question of what munimum sum total of marks is sufficient in order to substantiate an unqualified conclusion in each particular case is one of the cardinal questions in the theory of criminalistic identification. Its solution rests not only on the quality of the objects submitted to examination, the exhaustiveness and thoroughness of the conducted examination but also depends on the professional training, skills and experience of an expert, his attention, concentration and other subjective qualities, as well as the objective criteria of an appraisal he is guided by.

In the theory of criminalistic identification a rather important issue is the problem of rendering the criteria used in the appraisal of identification marks more objective. To elaborate objective criteria of appraisal means to raise the scientific level and trustworthiness of expert examination and bar the chance of expert errors. Mathematically substantiated quantitative criteria of appraisal have become a reliable supplement to the qualitative characteristic of identification marks. The probability-statistical methods make it possible to establish an individual, unique sum total of marks which is essential and sufficient for an unqualified conclusion as regards the identity.

The mathematical interpretation of identification marks allowed to construct their algorithms and use computers for tackling identification problems.

The unique individual sum total of identification marks is the only basis for the conclusion about the identity. A conclusion drawn by an expert can be positive or negative, unqualified or tentative. Only an unqualified positive or negative conclusion can serve as evidence, while a tentative conclusion of an expert cannot; it can be used exclusively for operative-search purposes.

If the sum total of features is insufficient for an unqualified conclusion, an expert confines himself to drawing a tentative conclusion with a sufficiently high degree of probability or abstains from giving a conclusion if there are not enough materials for an examination, these materials are inferior and unfit for identification. His incompetence or the absence of a reliable methodology of investigation can also serve as a motive for the refusal by an expert to supply a conclusion.

CHAPTER IV

THE DOCTRINE OF CRIMINALISTIC THEORIES

1. The Concept and Classification of Criminalistic Theories

Crime detection is the establishment of the genuine truth, a process of cognition. It cannot be carried out without the application of dialectical logic and the observance of the law and forms of logical thinking. The law of identity, contradiction, the excluded third, and sufficient substantiation, as well as logical conclusions, the rules of proving and disproving, hypothesis and other "figures" of formal logic are applied in crime detection.

In investigating the circumstances of a crime an important role is played by the method of analogy which is instrumental in the establishment of the truth by comparing the similar features of the investigated crime (the method, the instruments of a crime, the methods of concealment, etc.) with previously exposed crimes. It is quite appropriate to resort to the method of analogy in the course of preliminary investigation and court investigation since analogy serves as a logical foundation in advancing a theory.

Since crime detection is a process of cognition primarily dealing with the past events, a special role here is assigned to such formal logical category as hypothesis (theory). At the stage of preliminary investigation it is called an *investigation theory*, a substantiated supposition of an investigator as regards the investigated crime as a whole and its individual circumstances.

A hypothesis is extensively used in the planning of investigation, in the establishment of the circumstances of each crime. Here investigation theories play the role of probable informative-logical models of the investigated crimes and are subdivided into *general theories* covering specific deeds as a whole and *particular theories* explaining their individual circumstances. The motions of a working theory which is used in literature (a hypothesis as regards minor, less important circumstances of the crime) and the operative-search theory (a hypothesis as regards the place where a criminal or objects can be found) should be perceived as a variety of a particular theory.

The hypothetical method of cognition is characteristic not only of investigation and judicial activities but also of operative-search and expert activities.

At the stage of court investigation, they distinguish *court theories*. Theories advanced and checked in the process of operative-search activity are called *operative-search* hypotheses. The so-called *expert theories* are resorted to in expert practices. The above-listed theories are of the same logical origin. Some of their peculiarities and differences are due to the subject and nature of court, investigation, expert and operative-search activities.

In criminalistics there also exists a notion of *typical theories*, i. e., hypotheses characteristic of typical situations which arise during crime detection. For instance, in investigating a fire, when its causes are unknown, there can be the following typical theories: (1) the fire was the result of a criminal violation of the safety rules; (2) the fire was the result of natural causes, for instance, a lighting, in the absence of fire protection means; (3) the fire was caused by spontaneous ignition; (4) the fire was the result of arson.

Typical theories can be general and particular. The above four theories are general. Typical particular theories of arson can be, for instance, hypotheses in respect of the culprit: (1) arson was committed by a person working at that particular place; (2) arson was committed by an outsider.

Typical theories, being the result of the scientific generalisation of practice, are presented in the manual dealing with the problems of crime detection. In investigating a specific crime, the investigator advances concrete theories based on his evidence, account being made of typical theories.

The above types of theories are united into a single group of criminalistic theories. All theoretical elements dealing with their content, classification, evolution, the rules for their advancement, analysis and verification, as well as the conditions of trustworthiness form the doctrine of criminalistic theories.

2. Advancing and Analysis of Theories

The observation of the rules for constructing and verifying various theories is an important condition for a complete and objective investigation. In respect of any unclear or doubtful circumstances of a crime all possible theories must be advanced and verified. One cannot be carried away by one theory while ignoring the others just because they seem scarcely probable at a given time. All substantiated theories should be thoroughly checked.

An investigation theory as any other one, develops in three clearly-defined consecutive stages reflecting the entire process of an investigation.

The first stage is advancing an investigation theory. The second stage involves an analysis of the advanced theory and the outlining of a number of effects (circumstances, events, facts) logically stemming from that theory. The third stage includes a practical verification of the supposed effects and their comparison with the established real facts. If the comparison shows that the effects theoretically deduced through an analysis of the theory do not really exist it means that the advanced theory is untenable, does not correspond to the objective truth and must be discarded. However, if hypothetical effects do correspond to the established facts, that will prove the advanced theory is correct. Still, it would be wrong to take it for real knowledge corresponding to the reality because one and the same effects can stem from different foundations and it is possible that the established facts are engendered by another law (cause) which is not covered by the theory in question. For instance, in verifying a theory in respect of *L.*, who was suspected of misappropriation it was established on the basis of the effects of this theory that *L.* had lived in excess of his earnings. This fact was confirmed by investigation. However, as it turned out, *L.* had received an inheritance after his uncle's demise.

In putting forward and analysing an investigation theory the investigator first of all analyses the sum total of the established facts and then a hypothetical cause. The fact that the true cause is unknown engenders several mutually-exclusive theories competing with each other until it becomes clear which of them is groundless and which one reflects the objective truth.

The cognitive role of an investigation theory lies not only in its ability to explain the circumstances of a crime already known to the investigatory body but also because it enables to reveal new circumstances and facts unknown to the investigation by the time the theory was advanced. If the theory reflects the objective truth its content allows not only to deduce the effects (facts) whose establishment preceded its advancement but also those established subsequently.

The disclosure of new facts which were unknown before the theory was put forward and which came to light as a result of its verification enhances the reliability of the theory. The ability of a theory to explain not only the previously-known facts but to disclose new ones is an important prerequisite allowing to verify the trustworthiness of the basic content of the theory.

The above three consecutive stages of the development of a theory are of great practical significance. An omission of one of them leads to serious errors in the planning of an investigation and, in the final count, disrupts the time-limits set and affects the investigation's quality. Sometimes it happens that the planning of an investigation is limited to the formulation of theories and the enumeration of measures for their verification, while the content of these theories is not analysed, effects (facts, circumstances) are not established and specific questions which must be clarified in each of the theories are not planned. As a result, the list of measures for verifying the theories is incomplete. This disregard for the second stage of the investigation renders its verification purposeless and one-sided.

Advancing of Theories. The logical process of advancing a theory is similar for all its varieties (investigation, court, expert, operative-search, general and particular). Each theory must be sufficiently substantiated and cannot be a product of groundless surmises and artificial conjectures.

A theory must be based on certain facts which can be subdivided into two groups:

— information received from various sources and relevant to a particular criminal case. This information can be contained in court evidence, the materials of operative-search activities, statements of citizens, press reports and other sources. In the construction of theories on the basis of this group of data use is made primarily of such logical methods and forms of reasoning as analysis and synthesis, direct and indirect (mostly inductive) conclusions, analogy;

— data which are the result of generalisation and are not directly relevant to a particular criminal case but which, with the help of analogy, comparison and deductive conclusions, can be used as evidence for the advancement of a theory. These are data of natural, technical and other sciences (criminalistics, forensic medicine, biology, physics, chemistry, etc.), as well as data stemming from the investigator's personal and professional experience, and from generalisations of investigation, forensic and expert practices. In particular, in putting forward investigation theories the results of the criminologic analysis and the criminalistic characteristic of a particular type of crime are very important.

It would be wrong to believe that there is no direct link between the construction and verification of theories and the adoption of procedural decisions, that the adoption of the latter requires reliable assessment criteria, while it is possible to ignore these criteria in the elaboration of investigation theories. It is necessary to keep in mind that the verification of theories may necessitate the adoption of procedural decisions, the conduct of searches and seizures, etc.

The advancement and verification of theories must cover all obscure and dubious circumstances of the investigated crime. In respect of each of these circumstances it is necessary to advance all substantiated theories possible for a particular stage of investigation.

The hypothetical method of disclosure of a crime usually implies first of all the appraisal of the event under investigation as a whole and the advancement of general theories each of which is subsequently detailed, subdivided into a number of separate theories by individual circumstances covered by a particular general theory. For instance, if a body is found with the marks of violent death the investigator's reasoning usually begins with the general appraisal of the relevant information, and in this case three general theories are possible: (1) murder; (2) accident; (3) suicide. Each of them implies the advancement and verification of a number of individual theories. Thus, the theory of murder is subdivided into those of the time and place of murder, the executor of the crime, accomplices, the instrument of the murder, aims, motives and other circumstances of the crime.

The content and volume of individual theories varies: a theory can be relevant to one circumstance of the investigated event or two or more interrelated circumstances. More frequently than not, one particular theory can comprise several suppositions of the investigator as regards various circumstances of a crime (for instance, the subject and

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motives of a crime; the time, place and method of committing it). The analysis and checking of such "expanded" voluminous theories can be carried out only by a highly experienced investigator.

When dealing with complex, multi-episode cases it is more preferable to employ individual theories covering a definite circumstance of a crime under investigation. This approach increases the number of theories, while making their analysis and verification more simple.

The Analysis of the Content of a Theory and the Definition of Its Effects. In the logical analysis of the content of a theory the main point is to hypothesise the facts, events and circumstances which must exist in reality if the theory advanced reflects the objective truth. The identification of concrete consequences stemming from each theory is the basic task in the analysis of theories.

It is vital to foresee all effects following from the assumption made because the degree of the reliability of a theory is the higher the more effects there are in the course of an investigation. Consequences stemming from the theory advanced must be most thoroughly detailed in order to facilitate their comparison with the facts.

Consequences logically derived from the investigator's assumption as regards a particular circumstance of the crime under investigation are reflected in his questions subject to clarification. For a conduct of a comprehensive investigation, it is very important, in respect of each theory, to define an exhaustive list of questions which must be clarified in the course of verification. The causes of shortcomings in such investigation more often come to light in the stage when theories are analysed. In many instances such shortcomings are due to a superficial analysis of the content of theories and because the set of questions to be clarified is not precisely defined.

3. Verification of Theories

The goal of the verification of effects (facts, events, regularities) logically deduced from the assumptions made is to ascertain whether or not they exist in reality. Each theory advanced must be checked in this respect. The eventual goal of the verification of general and individual theories is to establish which of them reflects the objective truth and which of them are untenable.

The means and methods of verifying criminalistic theories vary and differ from the methods and means employed in verifying hypotheses which are used in scientific knowledge of the laws of nature and society. While being the means and methods of practical knowledge of a particular social phenomenon—a crime—and aimed at determining the guilt or innocence of a particular subject, the means and methods employed in the verification of criminalistic theories must correspond to the rigid criteria of reliability, legitimacy and moral admissibility. Conducted in conditions of certain legal treatment and of the necessity to observe the procedural time-limits set for the investigation of a crime, the verification of criminalistic theories cannot be based on the application of methods and means which are not permitted by law, nor can it be based on methodologies which are not scientifically substantiated and are at the stage of an experimental testing.

The specificity of verification means and methods is determined by the variety of theories verified. Investigation and court theories are basically verified by investigation and court actions, correspondingly. In this process use is also made of operative-search means and methods, but they are auxiliary in that case. However, while verifying operative-search theories use is mainly made of the means and methods employed in operative-search activities, while the procedural means can be resorted to insofar as they are used in a simultaneously conducted criminal case; it is inadmissible to use procedural means for verifying operative-search theories beyond the framework of court proceedings.

The forms in which special expertise is used for the verification of operative-search theories vary, too. In order to verify investigation and court theories they are primarily used in the form of a forensic examination or by inviting a specialist to participate in an investigation, while the verification of operative-search theories is characterised by the administrative legal form of the application of expertise.

Expert theories are also verified in accordance with certain legal regulations and basically by resorting to the methods of natural sciences and technical means.

The general rules for the verification of criminalistic theories boil down to the following. First of all, it is recommended to employ the principle of parallel (simultaneous) verification of theories which ensures the optimal pace of an investigation, the saving of the investigator's time, efforts and means. A consecutive, step-by-step verification of theories not only does not guarantee these advantages but, moreover, is fraught with a danger of losing traces of a crime and evidence and makes it necessary to repeat investigatory actions, thereby protracting the investigation.

In the verification of a theory none of its effects should be ignored by the investigator. Until the version advanced is refuted and cancelled every fact logically stemming from it should be verified as to whether it corresponds to the actual reality. If verification is limited only to a part of the consequences it undermines the confidence that the theory reflects the objective truth.

When faced with contradictory data, some of them fortifying the theory and others repudiating it, one must continue verification in order to identify and remove the contradictions.

For a more profound and comprehensive verification of the circumstances resulting from the theory it is necessary, as far as it is feasible, to use a set of various verification means, for instance, to interrogate witnesses, conduct an investigation experiment, carry out operative-search measures.

In the theories of versions the sequence of carrying out operative-search activities is determined by a number of factors. First of all, it is necessary to carry out activities needed to detect and fix the traces of a crime which are succeptible to rapid change, register the evidence which can be lost or altered. It is equally urgent to carry out measures which can prevent a potential crime and prevent a criminal from escaping or destroying real evidence.

All conditions being equal, preference is given to taking actions whose results bear on the verification of several theories, as well as those which guarantee more tangible and reliable results. It is preferable to carry out measures aimed at investigating the earlier stages of a crime before those whose goal is to check more recent developments.

As was mentioned above, the theory is verified until it is either refuted by the facts or conditions emerge allowing to believe that it corresponds to the reality.

A supposition about a fact taking place becomes a reliable knowledge of it if it turns out possible to prove that the established effects are the direct result of this very fact. A hypothesis becomes trustworthy knowledge too if it is proved that it is necessary to exclude as unproven from all theoretically probable causes of the given fact all causes but one which is a rootcause of that fact.

The above-listed requirements to the trustworthiness of a hypothesis are also applicable to the verification of criminalistic theories.

A theory is trustworthy if:

(1) all possible suppositions as regards the circumstance of a crime under investigation have been made and no theory relevant to the same circumstance and based on new, additional evidence, has emerged in the whole process of investigation. For instance, in a murder case from among the three most probable causes of a murder (premeditated murder, unpremeditated murder and an accident) the theory of premeditated murder was confirmed. If in the process of an investigation it was found out that theoretically in that case there could be more probable causes of the death the exclusion of two of them would not be sufficient proof of the correctness of the third one. The theory of premeditated murder, as the two others, could be untenable, while, for instance, the theory of a suicide — not advanced by the investigator — could be correct.

(2) all proposed theories of this circumstance have been checked; and all but one, which has been objectively confirmed by the facts, have been refuted and lost their validity;

(3) all effects (circumstances) logically derived from the confirmed theory have been thoroughly examined and proved correct, i. e. they did exist in reality;

(4) the corroborated theory is in full accord with all other circumstances of a case.

Only if all these requirements are met it is possible to say that the corroborated theory accords with the reality. The above-listed requirements to the trustworthiness of theories are applicable exclusively to similar theories, that is, theories which are relevant to one and the same circumstance of an investigated crime.

CHAPTER V

INTERACTION OF AN INVESTIGATOR AND OPERATIVE-SEARCH BODIES IN DETECTING CRIMES

A major requirement for a success in detecting crimes is cooperation between an investigator and the staff of operative-search bodies.

This cooperation implies concerted legal efforts of an investigator and operatives aimed at the exposure of a concrete crime and performed through the most expedient combination of methods and means applied in the course of an investigation, on the one hand, and operative-search measures, on the other.

This interaction is carried out on the basis of the law of criminal procedure and only in respect of the cases entrusted to the investigator.

The need for cooperation between an investigator and the operative personnel sometimes arises before a criminal case is instituted, for instance, when there is an urgent need to examine the scene of a crime.

Despite their common eventual goal (detecting a crime) and their coordinated efforts the investigator and operative worker act within their own terms of reference and their powers invested with by the law.

In cases for which a preliminary investigation is obligatory a body of inquiry institutes a criminal case and performs urgent investigatory activities: inspection, search, seizure, examination, detention, questioning. In cases when the criminal is not found the bodies of inquiry must be charged with taking operative-search measures in order to find the criminal and with keeping the investigator informed of the results of their activities after the transfer of the case to him.

By timely receiving the necessary information from the operative-search bodies the investigator is in a position to check it by investigation and legitimise it procedurally.

When a case is handed over to the investigator the bodies of inquiry are authorised to carry on the investigation and search activities exclusively on instructions of the investigator.

The goal of operative-search activities is to detect crimes and find their perpetrators. These activities are regulated by departmental rules. They are exclusively within the terms of reference of operative-search bodies. The law of criminal procedure does not regulate these activities, nor does it stipulate their categories.

Detective activities differ from operative-search measures. The former are usually understood as activities whose purpose is to find objects and persons known to the investigator. These activities take the form of questioning, requesting and obtaining information from officials, etc. Materials collected in this way can be used in preparing and conducting an investigation.

Detective activity is the domain of both investigators and operative workers. Investigators decide, for example, whether to entrust detective activity to the police or take it upon themselves.

The investigator can charge the police with undertaking a detective activity irrespective of the fact whether a crime is disclosed or not. In undertaking such an activity on the investigator's instructions the police can undertake operative-search measures and select appropriate methods and means to that end.

Instructions by the investigator to the body of inquiry for undertaking detective or investigatory activities, as well as rendering assistance in carrying out specific investigation actions are obligatory for that body and are given in writing.

Such instructions must be well-defined and precise so that from them it would be clear for the inquiry bodies what they are expected to do, when and with what purpose. The scope of various instructions depends on the nature and specific features of actions to be undertaken by operative-search bodies. For instance, in contrast to the specific instructions on undertaking investigatory activities, the instruction for a conduct of detective activities should be confined to indicating the goal, place and direction of these activities. The means and methods for tackling the task are not specified, for this is an exclusive competence of an operative-search body. The investigator's written instructions do not list direct executors since it is done by the chief of an appropriate body.

The right of the investigator in the cases he deals with to give instructions and directions to inquiry bodies for undertaking an investigation is normally used by him in cases when for some reasons he himself cannot conduct a particular investigation on time (for instance, to take part in investigations in several places simultaneously).

The investigator also has the right to request that inquiry bodies should assist in carrying out individual investigatory activities. This form of cooperation includes the participation of inquiry workers in the preparation and execution of individual investigatory activities. It means a direct practical assistance of tactical and organisational-technical nature which is rendered to the investigator. The need for such assistance can depend on the following factors: (*a*) difficulties involved in investigation (for instance, when a search is conducted it is also necessary to watch the searched person); (*b*) investigatory activities are carried out on vast areas (inspection, experiment, search); in these conditions the investigator alone cannot observe certain tactical requirements; (*c*) when substantial efforts are needed and various organisational and technical measures are taken (organisation of a search on vast areas, etc.); scientific and technical means are extensively used; (*d*) when the safety of the people participating in the investigation must be ensured (assistance in the detention made by the investigator and in searching premises of a dangerous criminal); (*e*) when the potential of operative-search bodies is needed in the preparation and carrying out of investigatory activities.

The investigator and operative-search bodies cooperate in various forms including the joint visiting of the place of a crime, the exchange of information, the planning of coordinated actions, the joint discussion of investigation and operative-search data.

The organisation of joint visits to the place of a crime is determined to a certain degree by specific conditions and therefore the following principles should be taken into consideration:

(*a*) on receiving a report on a crime investigators, operative officers and specialists must leave immediately for the place of the crime;

(*b*) it is advisable that there should be sent investigators and operative officers who are subsequently expected to participate in detecting the crime.

In close connection with the examination of the place of a crime investigators and operative officers jointly tackle such matters as looking for the witnesses; the establishment of the ownership of objects found at the place of the crime; pursuit and detention of a suspect; immediate searches, questioning and the performance of other investigatory activities with the use of the results of the examination.

Cooperative efforts in detecting a crime become effective as a result of a regular reciprocal exchange of information between the investigator and operative officers. The data received through operative-search activities are used by the investigator, while the information obtained from procedural sources serve as a basis for carrying out corresponding operative-search measures.

Depending on the nature of investigated crime the interaction can be irregular or protracted. The first implies ad hoc assignments. However, if there is a need for a constant, joint tackling of interrelated problems stemming from the task of detecting a crime and its perpetrator this cooperation is carried out on a long-term basis and usually organised at the time when a criminal case is initiated. Systematic investigatory activities and operative-search measures underly this cooperation. Planning ensures the purposefulness and proper sequence of the steps taken by the investigator and operative officers participating in detecting a crime. This prevents duplication in the examination of particular circumstances of a crime.

It is recommended that plans for investigation and those for operative-search activities in a case should be separated. However they should be coordinated by common tasks and goals. There should be a strict delimitation between investigatory activities and operative-search measures to prevent the investigator from interfering with the latter.

Coordinated planning embraces all aspects of cooperation in detecting crimes. It defines what circumstances relevant to a particular case have to be established and verified by investigation and what circumstances require other measures.

The activities of the investigator and operative officers in the field of coordinated planning extend beyond the compilation of written plans. In the course of their realisation they should jointly discuss the data received both as a result of investigatory activities and operative-search measures. The plans should be timely adjusted, in particular with the view of coordinating investigatory activities and operative-search measures.

The establishment of permanent investigation and operative groups is instrumental in ensuring a constant interaction allowing to combine operative-search measures and procedural actions in the course of preliminary investigation. And it is necessary to strictly define their bounds and ensure the best combination of their efforts in the process of concerted activities.

PART TWO

CRIMINALISTIC TECHNIQUES

CHAPTER VI

FUNDAMENTALS OF CRIMINALISTIC TECHNIQUES

1. The Concept and System of Criminalistic Techniques

As a branch of criminalistics, criminalistic techniques represent a system of scientific tenets and corresponding devices and methods used in uncovering crime.

Criminalistic techniques include instruments, equipment, tools, devices and various concepts of methods and means.

Yet, the above terms are used in their narrow meaning, too. The technique connotes the component part of some method. For instance, a familiar method of criminalistic investigation is microphotography, which may be performed in two ways: by using a microscope or an extension tube.

In the narrow sense, a technique is a specific action, which represents a component element or a part of some method. Exposure in microphotography (indirect, side, vertical, etc.) could serve as an example.

Again, in the narrow sense, a technique involves a totality of several methods used in resolving some task. The technique of criminalistic examination of documents for uncovering signs of counterfeit may envisage a definite sequence of techniques, e. g. microscopy, colour discrimination, luminescent analysis in ultraviolet rays, etc.

Technical and criminalistic means and methods are used to prevent crimes and also to uncover and investigate them in time and to resolve criminal cases in court. They are widely used by investigators, for instance to uncover, register, remove, and carry on a preliminary examination of exhibits, and also by criminalistic experts.

In the last case, criminalistic techniques develop the scientific principles, technical means, methods, and specific methods of various kinds of criminalistic examinations, and the logic of expert investigations and rules for formulating conclusions.

Criminalistic techniques are based on technical means and methods, and also on individual criminalistic objects. We can therefore distinguish two sections in criminalistic techniques. One examines sets of technical means used in operative-search activity, physical and chemical investigation methods, and forensic photography. The other gives recommendations on work with various real evidence and on criminalistic recording. It includes forensic photography, traceology, forensic ballistic (which examines the fixation, removal and study of firearms and traces of their use), technical and criminalistic examination of documents, criminalistic examination of writing, identification of people by their appearance, and criminal registration.

Criminalistic Means of Research and Their Legal Use

For different reasons, the scientific and technical means are classified into different means:

Depending on origin, they constitute two groups:

(a) those developed in conformity with general techniques and adapted to specific criminalistic tasks; and

(b) those developed exclusively for criminalistic tasks.

Devices for taking stills and movies, tape recording and general-purpose videorecording, and also the general methods of their application belong to the first group of technical and criminalistic devices, while special cameras designed for criminalistic research, particularly for taking pictures of handprints, criminalistic search devices, reactive paper for copying handprints fumigated by iodine vapors, and methods for simulating traces by means of polymer materials belong to the second group.

With regard to purpose, the means and methods of criminalistic techniques are also classified into two types.

The first type includes those designed for investigators and criminalists, which they use to detect, remove and register evidence, i. e. means for taking stills and movies, revealing traces of crime, tape- and videorecordings, and devices for detecting concealed criminalistic objects, and also those used in operative-search activity to prevent and quickly uncover crimes, to search for and detain suspects, alarms and observation and communication instruments, and devices for protecting documents against counterfeit.

The second type includes devices used in examining real evidence, chiefly in performing criminalistic expert examinations. These are means and methods involving forensic research photography, measuring instruments (goniometres, micrometres, diometres, photometres, etc.), optical instruments (magnifying glasses, microscopes, etc.), analytical luminescent lamps, equipment for spectral analysis (emission, atomic absorption, spectrophotometric, and X-ray devices), chromatography, colorimetry, refractometry, neutron-activation analysis, and other physical, chemical and physico-chemical research of criminalistic objects.

The means and methods of criminalistic techniques are applied in various forms, depending on the legal status of those involved in uncovering crimes (investigators, persons making inquiry, specialists, detectives. experts, judges), on their specific objective (detection, registration, removal or study of evidence), and on the procedural significance of the results (direct source of evidence mediated by the expert's opinion, but one that has no conclusive evidence). Besides, all the participants in the investigation have the right to use those means and methods only in the form that is within their competence.

They may use in their work not only investigation and operative equipment, but research devices as well. The latter shall be used in the form of so-called preliminary investigation of real evidence designed to suggest investigation theories and establish the best ways for revealing evidence. The results of applying various technical means during preliminary investigation of real evidence show in the totality of material signs revealed during analysis, and also in the investigator's conclusion, which, however, has no conclusive significance and is not recorded in the procedural document.

The investigator, the person making inquiry, specialist, or judge have no right to use research means for direct expert examination. This is the expert's prerogative.

The results of applying technical means during expert examinations involve the totality of signs revealed during the examination and also the expert's findings, which according to law is a means to establish the truth.

The delimitation of the competence of the investigator and expert in applying research means is of major significance. The investigator may restrict the use of research means for examining real evidence by inspection, without resorting to expert examination, provided all the participants in the criminal procedure clearly perceive the uncovered signs of the object under study, and also the course of investigation and its underlying processes. The court and other participants in the procedure shall clearly understand the principles underlying the use of various means, and the said participants shall be able to verify the result obtained by the investigator by studying with those means the real evidence *per se*, not its impression, the result of the investigation. Otherwise, the court and other participants in the process would not be sure that the facts established by the investigator correspond to reality.

To study real evidence, the investigator shall independently make most frequent use of only unsophisticated research equipment needing no special knowledge. This shall mainly include optical devices like the magnifying glass, microscope, light filters, and so on.

In performing procedural actions, the use of research equipment could result in conclusive evidence only when it is duly recorded.

In accord with Soviet legal proceedings now in force, the use of criminalistic research equipment shall be recorded in a document formalising a given procedural action (investigation protocol, expert's conclusion, protocol of court proceedings). The document shall indicate the equipment, methods and conditions involved (e. g. lighting conditions for photography, spectral sensitivity of the material used, and light filter model).

The photographs, casts, fingerprints, etc. obtained by means of research equipment shall be supplied with explanatory texts certified by the investigator and witnesses, and appended to the corresponding procedural document.

The explanatory text shall indicate the name of the identified or investigated object, interpret all conventional symbols, pointers and other marks, the procedural action involved in using the said research equipment, and the date of the action.

2. Criminalistic Means in Detecting, Registering and Removing Evidence

Portable sets of research equipment are frequently used in investigation, especially in inspecting the scene of an event and during search. Most of them are known as investigation bags and portfolios. Conventionally, they may be classified as universal and specialised. The first type includes devices, instruments and appliances for performing numerous technical operations involving detection, registration, seizure and preliminary investigation of different real evidence. The second type is used to perform a limited scope of technical actions, e. g. to detect and fix handprints.

A universal set for investigators from the Procurator's Office would be one that comprises both the investigation portfolio and photographic kit. The investigation portfolio contains measurement equipment, and devices for drawing plans and schemes and revealing, fixing and obtaining traces, and also other instruments. Tape measures (3 and 10-m-long), rulers, protractors, sliding calipers, a map case and compass are designed for making measurements and drawing schemes.

The sliding calipers allow to measure linear magnitudes, e. g. a bullet diameter or cartridge case mouth, with accuracy up to 0.1 mm. Its main scale and vernier are calibrated. When gripping the measured object between the jaws of the sliding calipers, one notes the whole number on the main scale to the left of the vernier zero gradation. One millimetre decimals are determined by the main scale graduation with which a given vernier mark coincides.

Objects needed to investigate handprints, e. g. iodine tube with bulb, polyethylene vessels with powders, grainer brush for applying powders to traces, magnetic brush for revealing traces by using iron powder, trace-copying film, magnifying glass, scalpel, and appliances for taking fingerprints (rubber roller, tube with paint, and plate for applying paint) are contained in a separate portable case.

The portfolio contains equipment for making gypsum and other casts of volumetric traces: two polyethylene bags with gypsum, vessel for diluting gypsum solution, spatula, modelling clay (for copying traces of burglar tools), vaseline oil (for smearing traces on solid materials before making their clay casts), and sprayer. Some of the devices, e. g. the steel needle and flashlight, may be used to examine soft furniture.

A triple illuminating and quadruple magnifiers are used to inspect real evidence. The former represents a magnifying glass mounted in a cylindrical polyethylene frame. A threaded nipple is installed in the middle of the frame to screw in the flashlight after removing a glass-equipped reflector.

The investigation portfolio is from time to time replenished with materials used to reveal and register traces. These materials include iron powder, crystalline iodine (for fumigated handprints), silicon paste with catalyst (for making casts and imprints of traces), zinc oxide (used as filler for making paste casts), perchlorovinyl (whose solution in acetone allows to fix traces on dry substances), orthotolidine powder (whose aqueous solution fixes handprints fumigated by iodine vapours), and luminol and calcinated soda (whose solution in the presence of hydrogen peroxide reproduces blood traces).

The photography kit is contained in a leather bag with a shoulder strap. It includes a small-size mirror camera, electronic flashlight, photoelectric exposure metre, yellow light filter, extension rings (used in large-scale photography), two cassettes, scale, and digital tables (for designating the most important details of the surroundings).

In addition to technical devices in the investigation portfolio, the investigation bag also includes a magnetic jack for extracting objects made of non-ferrous metals and contained in water bodies or some other loose medium, e. g. snow (the device uses the lift force of a permanent horseshoe magnet made from special alloy); a collapsible steel feeler for detecting objects concealed under ground, snow, or other mechanically permeable medium; device for taking samples deep from the investigated medium (either ground or material concealed underground); device for checking current in electric wires (current finder); set of dosed silicon pastes; pneumatic sprayer of solutions for fixing traces on dry materials (sand, flour, cement, etc.); set of reagents and devices for detecting blood traces; and criminalistic colour discriminator.

An electronic flashlight with universal current supply is used in the modified photography kit as an illumination source. The kit also includes a wide-angle replaceable lens, polarised light filter (for taking pictures of objects with refined surfaces), tripod (for securing the camera when taking pictures with lengthy exposures), and appliance for charging cassettes in light premises (light-protecting sleeve).

The portable kit (bag) for the procurator criminalist is universal. Besides various devices for finding traces, it contains search appliances, e. g. a magnetic lift, trawl, feeler, and induction-type metal finder.

The trawl is designed to find dead bodies, their limbs, and also clothing in water, and represents a steel-wire frame with several hooks (T-pieces) attached.

The metal finder allows to detect ferrous and non-ferrous metal objects buried underground or concealed in some secret recess. It is equipped with a generator which converts direct current into alternating high-frequency current. The oscillation circuit includes a coil, which generates an a. c. magnetic field. When the finding element passes near a concealed metal object, the latter generates eddy currents which form a secondary magnetic field, which in turn induces currents in the receiving coils. After being amplified, electric signals turn into sound signals received by telephone (earphone).

The kit includes several technical devices for preliminary examination of real evidence, viz. a portable electronic-optical converter (EOC), ultraviolet illuminator, and measurement and illumination magnifiers. The EOC is designed for investigation in IR rays. In using the device, the lens forms on the photocathode (plate coated with special compound) an invisible image, which dewelops owing to IR rays. Under their effect, the photocathode emits (from the inverse side) a flux of electrons focussed by a magnetic "lens" onto a luminescent screen to produce a visible image observed through an ocular. The image is focussed by adjusting the frames of the ocular and lens.

Mobile criminalistic laboratories are specially equipped cars that allow to deliver to the site of various investigations a considerable number of research devices. The most frequent types of laboratories are those consisting of a main compartment and dark compartment. The former is used for various procedural and technical actions (interrogation, inspection, packing of real evidence, etc.), and the dark compartment to develop films, print stills, and examine real evidence in UV rays.

The laboratory is equipped with technical devices, which may conventionally be classified as follows: (1) electrotechnical equipment; (2) communication and signalling devices; (3) photographic equipment; (4) devices for detecting, registering and preexamination of real evidence; (5) fire-extinguishers and appliances; (6) auxiliary technical equipment; (7) overalls and first-aid kit.

The first group includes a. c. generator actuated by an internal combustion engine; two batteries of plumbite accumulators rechargeable by a silicon rectifier; relay for regulating voltage, preventing high-current overloads, and engagement to and disengagement from mains of generator with rectifier.

Communication and signalling are provided by a loudspeaker, electric horn, and flicker device. The laboratory also has a place for installing a portable wireless.

The photodepartment includes a small-size mirror camera, tripod, electronic flashlight, stable light illumination sources, millimetre scale, and digital tables for specifying characteristic features of photographed objects.

The equipment for detecting, registering and removing evidence include a tape recorder, typewriter, device for obtaining microparticles, and search devices (induction-type metal finder, magnetic lifter, and mechanical feeler).

3. Technical Devices and Techniques for Examining Real Evidence

Examination with a Magnifying Glass and Microscope. The magnifying glass represents a double convex, i. e. converging lens, or a positive system comprising two lenses encased in a frame.

Magnifying glasses of various types are used in criminalistics, and many tasks are successfully resolved by a binocular magnifier consisting of two lenses or two systems of lenses to allow to perform observations with both eyes simultaneously.

The dactyloscopic magnifier for examining fingerprints is also widely used. Its sliding frame is connected to a metal tripod secured on an annular base. A round mirror is mounted into the tripod base, and a fine line along the mirror diameter is drawn to make it easier to count the number of lines on a given site of the papillary design, for instance between the centre and delta.

Various particles (grains and shots) may be examined by the so-called granular magnifying glass. The particle layer is filled in between the skirtings of the round bases of the magnifier base.

A special magnifying glass (X4 or X7) is used to examine textile fabrics. It is supplied with a stand, whose base represents an 11 cm or 22 cm window which serves as an arresting device when counting the number of threads in the fabric samples compared.

The microscope is used in studying real evidence (documents, shot traces, fibre traces, etc.) when a magnifying glass is insufficient.

The microscope's main elements are the tube, stand, stage, eyepiece, lens, condenser and mirror.

The lenses have specific focal distance: the less the focal distance, the greater the lens magnification, and also the less the depth of focus, i. e., the smaller the distance along the optical axis where the details distinctly visible under the microscope lie.

Focussing is achieved by moving the microscope tube, first by using the rough focussing screw and then the fine focussing screw.

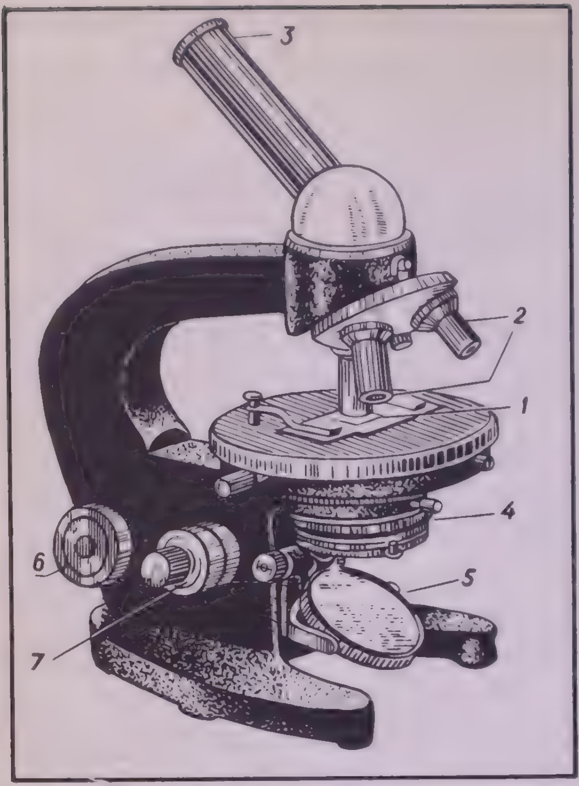

Fig. 1. Microscope:

1. stand; 2. lenses; 3. eyepiece; 4. condenser; 5. mirror; 6. macrometer screw; 7. micrometer screw

The microscope condenser is usually the light source. Semi-transparent objects may be examined in transmitted light. The light is then directed onto the microscope mirror, which reflects and transmits it through the lens via the condenser and the object under examination.

In addition to monocular microscopes, criminalists also use binocular stereoscopic microscopes equipped with two eyepieces and two lens to perform observations with both eyes simultaneously and create the impression of a volumetric (three-dimensional) image.

Criminalists often use comparison microscopes, which allow in one field of vision separated into two equal parts to observe simultaneously two objects which are to be compared one to another.

Comparison microscopes are most often used to study traces on bullets and cartridges. For example, if a bullet found at the site of an event and one obtained in experimental shooting were fired from the same weapon, the details of compared traces observed in the field of vision of the ocular would coincide when the two bullets are placed on the microscope stages (see *Fig. 3*).

Criminalistic objects are sometimes studied by a double microscope, which consists of two optical systems, one to pro-

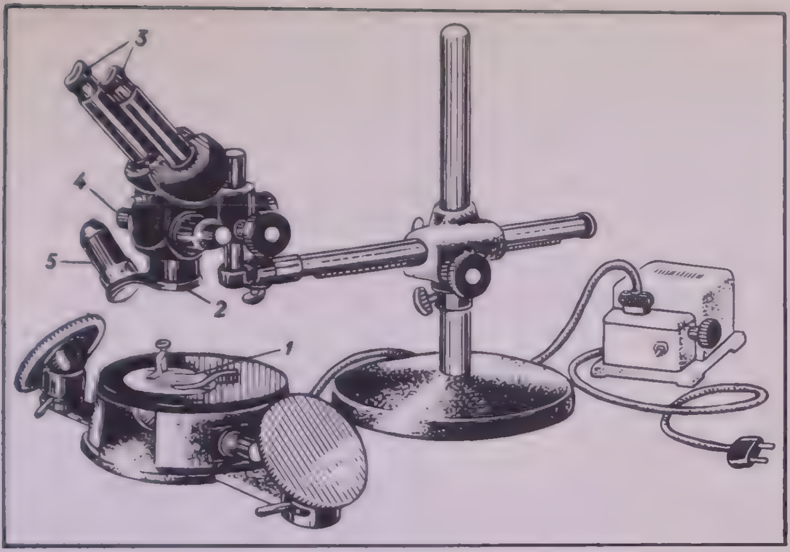

Fig. 2. Stereoscopic microscope:

1. stand; 2. lens; 3. eyepiece; 4. lens transposition handle; 5. light source

ject the image of the lighted slit onto the surface studied, and the other to observe it. On smooth surfaces, the slit image has the form of a uniform light band, and on uneven surfaces looks like a broken line.

The double microscope allows not only to reveal uneven surfaces, but to measure their height. The instrument is used chiefly to study the traces of firearms on bullets and cartridges, and also traces of tools and instruments used by burglars.

The metallographic microscope is also used in criminalistic research. It is reckoned on vertical lighting, with which the

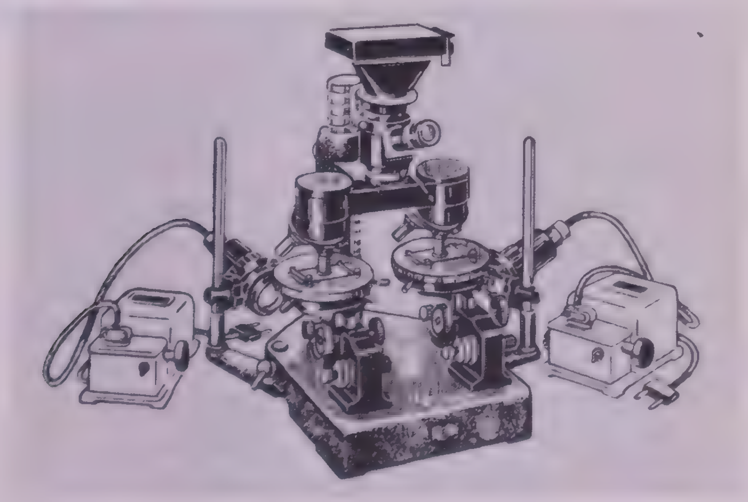

Fig. 3. Comparison microscope

light, by means of a prism or plane-parallel glass plate, is directed onto the object studied via the microscope lens, either at right angle or close to that. Vertical lighting helps to study the crystalline structure of objects made of metals and alloys, and also the different strokes (hachures) produced by pencil and carbon paper when examining documents and to establish the sequence of crossing strokes.

Studies in Ultraviolet Rays. Ultraviolet rays are invisible to the human eye; on one side they border on X-rays and on the other on violet rays of the visible part of the spectrum, where they occupy a wave length interval ranging from 10 millimicron (nm) [1] to 400 nm.

Depending on the composition and state of the radiated object, luminescence may vary in colour and brightness. Owing to this quality of ultraviolet rays, their use for luminescent analysis allows to distinguish materials similar in form when observing them in visible light. Again, due to the different chemical composition of paste, many varieties of paper luminesce differently. Similar dyes also vary in luminescence. This method allows to readily distinguish mineral (machine) oil from organic oil and some powders, e. g. flour and chalk, and to reveal bullet inlet holes resulting from shots fired from weapons with lubricated bore. It also helps reveal texts written with invisible, so-called sympathetic ink which can luminesce.

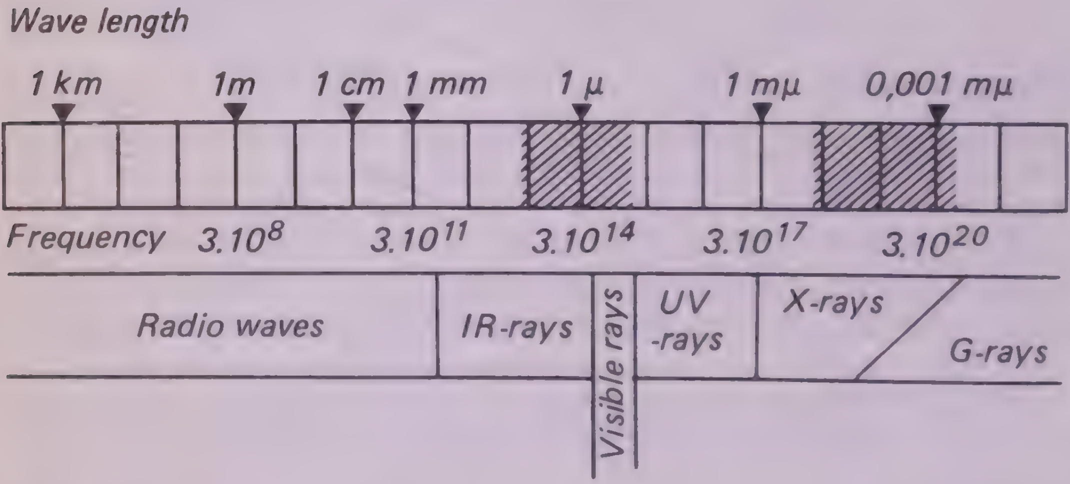

Fig. 4. Electromagnetic spectrum (shaded areas are used in criminalistic research)

In favourable cases, luminescent analysis allows to reveal etching of records and to restore etched records.

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[1] One millimicron equals one-millionth of the millimetre.

Luminescent devices of various design are used in criminalistics. The source of ultraviolet rays is usually a mercury-quartz lamp in the form of either a rectangular tube or a spherical- or pear-shaped bulb. The lamp comprises a quartz vessel filled with inert gas, e. g. argon, and a small amount of mercury sprayed over its internal surface with electrodes (anode plus cathode) incorporated therein. When the lamp is switched on, it starts generating mercury vapours, via which electrons jump through to generate a light flux rich in ultraviolet rays. A special filter is used to absorb visible light. Inasmuch as conventional glass largely absorbs ultraviolet rays, the filters are made of quartz or special (uviol) glass.

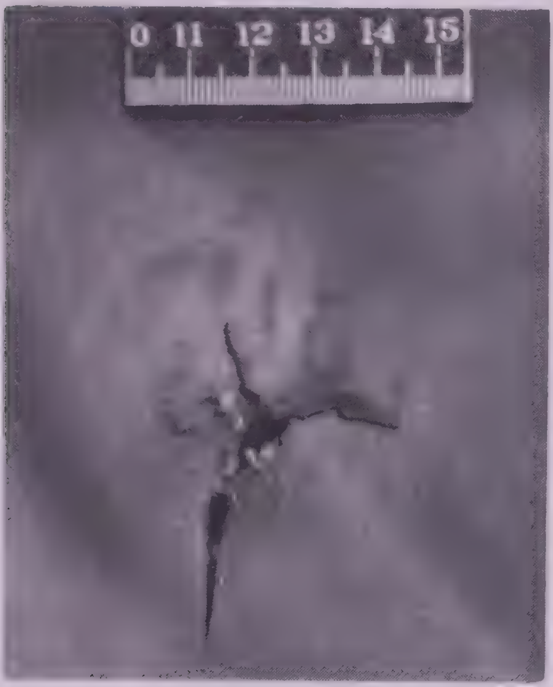

Fig. 5. Traces of close-range shot on clothes poured over with blood:

left — picture in visible rays, right — picture in infrared rays (with visible deposit of soot from shot)

Research in Infrared Rays. IR rays form part of the spectrum bordering on the red range. They occupy an interval ranging approximately from 750 nm to ultrashort radio waves, invisible to the naked eye.

Criminalists chiefly use the ability of these rays to be absorbed by different substances, e. g. graphite, soot, Indian ink, and printing ink, are reflected well by white paper, penetrating through fine layers of aniline dye, ebonite, and blood spots. Hence, if a text in some document is written with pencil, Indian ink and printing ink, or by using carbon paper, and is then crossed out with synthetic ink or stained with blood, it may nevertheless be developed in reflected infrared rays. In the same way, one can reveal traces of a close range shot in the form of gunpowder soot on some dark object stained with aniline dye, and distinguish objects with similar appearance, which in varying degrees absorb and reflect IR rays.

To examine a criminalistic object, it is usually illuminated with an electric incandescent lamp. The investigation results are fixed photographically in reflected infrared rays or perceived directly by means of an image converter.

Criminalistic research also involves infrared luminescence, which is based on the ability of some substances to radiate infrared rays under the effect of the blue-green range of the spectrum. The research object is placed in a light-tight casing with two openings on the sides and one on top. Through the side openings, the object is illuminated with movie projector tubes with either one or two blue-green filters placed in front. The camera lens is covered with an infrared filter. "Infrachrome" material is used in photography.

This method may be used to distinguish several materials of different chemical composition, but similar in appearance, and to reveal some invisible texts (that had either bleached under sunrays or were etched by certain chemical reagents).

Spectral Analysis. This form of research is based on distinguishing the spectra of light energy radiated by objects with different chemical composition when heated or absorbed thereby. Light energy is analysed in using the method of radiated spectral analysis. This involves a spectrograph. An insignificant amount of the substance to be analysed is placed in the electric arc or spark flame, where under high temperatures (ranging from 6,000 to 8,000° C) it passes into gaseous state. In this case, the atoms and ions of the substance irradiate light directed by a lens onto a narrow slit, and then onto a glass prism or diffraction grating (system of narrow slits), depending on the spectrograph design. The prism or grating disperses the rays that pass through it, the dispersion angle increasing with smaller radiation wave-length. An image of the spectrograph slot in the form of lines of various colour, ranging from violet to red, would form in the focal plane of the lens situated behind the prism.

Every line would correspond to some specific radiation wave-length. The resulting spectrum is reproduced on a photographic plate. The spectrograms are interpreted for standard spectra and reference tables by a spectroprojector.

This is the way to establish what chemical elements the lines in the spectrum correspond to. After having measured the optical line densities on a microspectrophotometer, the researcher would determine the ratios of the elements comprising the sample analysed.

To avoid mistakes caused by accidental factors, several analyses of the same object are performed to establish by mathematical statistics the average ratios of elements contained in the substance.

Radiation spectral analysis is used in criminalistics chiefly to determine the type of unknown substance, and to specify its chemical composition and either the similarity or difference of the objects compared (shot, buckshot, automobile lacquer-and-paint coatings, glass, soils, tobacco, fibres, etc.).

Absorption molecular analysis is also used in examining real evidence. It is performed by means of a special device called spectrophotometer. The research scheme is as follows: a parallel light beam is directed onto the analysed object or a sample solution taken from it; having reflected from the object, or having passed through the solution, the light enters the analysing device, which decomposes it into a spectrum, the latter is examined directly and then photographed or measured.

The results of absorption molecular analysis are often used to make a graph to plot the emission wave-lengths on the horizontal axis, and the reflection of transmission coefficients on the vertical axis. Modern spectrophotometers measure light by means of photoelements. In automatic devices, graphs are reproduced automatically. Graphs combined with special standard spectrophotometric characteristics make it possible to determine the quality and quantity of the substance studied. The spectrophotometer is reckoned on either all the spectral zones, or the visible zone, or the infrared zone.

Absorption molecular analysis makes it possible to distinguish various dyes, lacquer-and-paint automobile coatings, gunpowders, narcotic preparations, varnishes, lubricants, toxic chemicals, and other substances.

Chemical and Physico-Chemical Investigations. Chemical and physico-chemical methods are used in criminalistics to examine real evidence, usually to determine the type and chemical composition of various kinds of materials and substances, e. g. ink, pencil rod material, glue, paper, gunpowder, combustible fluids, lubricants, soils, etc. Chemical composition features are used to establish whether the objects compared are similar or different. Qualitative chemical or physico-chemical analysis allows to establish the component elements in the material of the object studied, and quantitative analysis—to determine their ratio.

The simplest qualitative chemical analysis is performed by subjecting the object to the effect of corresponding reagents, either in test tubes or by drop analysis. The nature of the substance studied is assessed by signs that reveal due to interaction with some reagent (staining, specific odour, precipitation, etc.).

Microscopic research (microcrystalloscopy) is performed to specify the nature of a crystal precipitate.

The amount of substances composing the object under study is determined by one of the following methods: (a) by weighing the precipitate resulting from the interaction with the reagent (gravimetric analysis); (b) by the intensity of staining resulting from some specific reaction (colorimetric analysis); and (c) by the volume of the reagent needed to complete the interaction with the substance analysed (volumetric analysis).

Diffusion copying, electrography, chromatography, polarography and some other methods are used for physico-chemical analysis in criminalistics.

Diffusion copying may be used to reveal some invisible and poorly visible entries in documents; it essentially involves the following procedure. A sheet of photographic paper, film or plate is moistened under red or orange light in distilled water and pressed with an emulsion layer to the document studied. In this case, the invisible dye particles for developing the hatchure would either increase or decrease the photoemulsion light sensitivity in contact sites, depending on the type of dye. After separating the photomaterial from the document, the researcher shall illuminate it with orange light, and then develop, fix, wash and dry it. In case of success, the revealed entries would reproduce on the photomaterial.

In favourable cases, the use of electrography allows to reveal traces of metals directly invisible, and to determine the type of metals involved.

Electrography involves the following procedure. The object studied is moistened in special current-conducting fluid and superimposed with a sheet of gelatin paper preimpregnated in the same fluid. The object studied and the sheet of paper are then pressed between aluminium plates, supplied with direct high-voltage current. Due to electrolysis, invisible particles of metallisation traces are anodically dissolved and introduced in the paper gelatin layer; the paper is subsequently subjected to the action of special reagents which give colour reactions with specific metals. One can judge of the presence and type of metal revealed by the presence and colour of the spot on the trace-copying paper.

Chromatography involves spatial separation and analysis of the components of the susbtance studied. Depending on the method of separation, one would distinguish paper, thin-layer and gas chromatography.

When using paper chromatography, the substance under study is transferred into a special solution, in which a strip of filter paper is immersed. The solution is absorbed by the paper, and the components of the analysed substance, owing to their varying ability to spread over the paper, are found to be present in different sites (levels), where they are established by reagents resulting in colour reaction.

In thin-layer chromatography, a thin layer of solid adsorbent, e. g. silica gel smeared onto a glass plate, is used instead of paper.

Gas chromatography involves a special device called a gas chromatograph. By introducing a solution of the substance studied into the chromatograph column filled with an adsorbent (activated coal or some other substance), the researcher would heat the column to pass through it an inert carrier gas. In this case, the molecules of the component parts would be consecutively removed into the detector section to determine their physical properties. The investigation result would show in the form of an automatically drawn curve (chromatogram) subjected to subsequent interpretation.

Paper and thin-layer chromatography are often used to analyse marks of ink, oils and oil products.

Gas chromatography is often used to determine the type of combustible fluid e. g. kerosene, benzene or ligroin, by the traces involved.

The polarographic method involves the use of a special instrument called polarograph. A solution of the substance studied is poured into a vat, where the anode is a mercury layer at the bottom, and the cathode comprises mercury added dropwise to the solution. Electric current is passed through the latter and the I/V ratio, caused by the composition of the substance studied, would automatically show as a graph. This method is used to determine traces of wine, honey, food products, gunshots, metals, and/or poisons.

CHAPTER VII

FORENSIC PHOTOGRAPHY

1. The Concept and Significance of Forensic Photography

Forensic photography is a branch of criminalistic techniques which is composed of a system of scientific tenets and corresponding technical means and methods of photographing objects under criminal examination with an aim to detecting a crime.

Photography is used in crime detection in order to fix and record traces, objects, scenes of crimes and other objects under investigation, as well as in the investigation of real evidence. As compared to other means of fixing evidence (such as drawing up a report of investigative activity, preparing charts, sketches or drawings), photography guarantees a higher degree of accuracy, completeness and visuality of impression. In photographs, all features of the objects which fall into the field of view of the lens are fixed. In addition, the relative speed of photography is also significant.

In the given definition of forensic photography, the term "methods of photographing" is used in a broad sense to mean any combination of the principles of photographing. In addition, methods are also differentiated in a more narrow sense, as particular devices for, and different kinds of, forensic photography. In such a definition, the term "method of photographing" refers to a specific system of rules which are brought into play in those situations when needed. This is done through the use of specialised photo-technical means which guarantee photographs with set characteristics (for example, photographs used for measuring, panoramic views, etc.).

There are two kinds of forensic photography: *impression* and *research*. The first is designed to reflect material objects and its features which may be perceived by the naked eye.

The second is used to reveal details which go entirely undetected, or which are barely visible under normal circumstances.

Impression photography includes the following types of photographs: panoramic, measurement, identification, reproduction and stereoscopic. [1]

Research photography includes: microphotography, infrared photography, contrastive photography, colour-differentiation and others.

The individual method of photographing is a system of specific rules which have relevance only to separate photographic operations. Individual methods of forensic photography include orientation, survey, nodal and detailed.

A given type of forensic photography may be defined as a system of methods, devices and rules of photography which are applicable to varied types of objects under criminal investigation (for example: scene of a crime, corpse, real evidence and so forth).

The complex of scientific theses, means and methods of photography which are used during criminal investigation and practical operative-search activity is called "practical forensic photography". That complex which has relevance for criminalistic expert examinations is called "expert forensic photography".

2. Methods of Impression Photography. Panoramic Shots

The term "panorama" refers to the type of shot which produces a photograph whose length significantly exceeds its width. This method is used for taking pictures of extended segments of a location, elongated objects (for example, a long or tall, narrow building), as well as for shooting crowded conditions on a certain site when it is imperative that one photograph show a group of objects which, under optimal conditions, would not fit into a normal frame.

This type of photography is taken with the help of specialised equipment, or with an ordinary camera while observing a set of fixed rules. A panoramic camera has a fixed focus. While the shutter is open, the lens moves along a horizontal surface, constantly exposing the film.

When using an ordinary camera, the object is photographed

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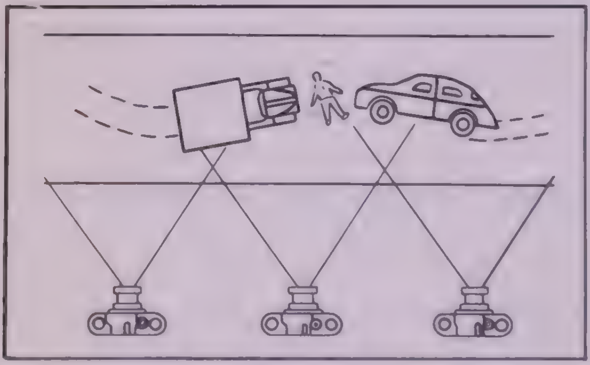
[1] Stereoscopic photography is rarely used in investigative practice and will not be discussed in this text.

in several segments and the resulting prints are then combined into a montage which produces the desired panorama.

In order to avoid gaps in the final montage, each successive shot is fixed to overlap 10—15% of the previous shot. When combining these photos into the montage, the repeated segments are cut off and discarded.

A panoramic shot with an ordinary camera is done by using either a linear or circular method. As regards the former, the camera is placed at consistently equal distances from the object along an imaginary line which unites the extreme edges of the foreground.

If the object has a horizontal extension (for example, the bank of a river, a railway platform, a train), the resulting panorama is described as horizontal. If the extension is a vertical one (such as a tower or an industrial smokestack), the panorama is, of course, referred to as vertical. In the event that the panorama has both a horizontal as well as a vertical extension, a compound vertical-horizontal montage is constructed.



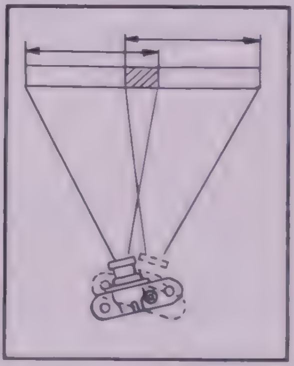


Fig. 6. Linear panoramic photography

Fig. 7. Circular panoramic photography (dotted lines show camera rotations; shaded areas are overlappings of adjacent frames)

Certain tall objects are photographed in segments from vantage points of, for example, the windows or balconies of neighbouring high-rise buildings, from a fire escape or from the elevated platform of a fire-truck. Most frequently, so-called single-plane panoramas are constructed which consist of fragments shot on a single plane. Those panoramic shots composed of segments shot on a number of parallel planes are called "multi-planar".

The method of circular panoramic photography is used in fixing those conditions which surround the object under investigation when the object is located in an open space (for example, a corpse found on a waste ground). In order to produce such a shot, a camera is mounted on a tripod with the aid of either a panoramic head or a universal clamp. It is then rotated along the vertical axis at a fixed angle (along a graduated limb) and the film is exposed at each turn.

In order to maintain an identical optical density, all pictures are taken under the same conditions of lighting, aperture and exposure. Prints should have equal exposition, and should be developed simultaneously, in a single bath with solutions of identical temperatures.

Scale Photography

This term refers to the simplest method of measurement photography which allows for the determination of the linear dimensions of objects and their component parts by means of an imprinted scale.

In the given method, a measuring scale is superimposed onto the surface of the object which is directed toward the camera. This scale may indicate either millimetre or centimetre divisions, and may be any of the following: a measuring tape, a ruler, or a photographic representation of either.

A scale is also used which, in addition to millimetre and centimetre divisions, shows 5 and 10 centimetre segments, with every other one painted black.

When taking pictures of small objects a small scale (2-3 cm) is used which contains millimetre divisions. Remote objects of significant size are photographed with a sufficiently long scale, divided into centimetres.

In the event when it is necessary to record details of one or several objects located on planes which are at varying distances from the camera, several scales are used, distributed among the various planes.

When recording real evidence with a camera whose lens is directed downwards, the scale is superimposed horizontally along the upper edge of the object. If the surface is a vertical one, the scale is affixed using thumbtacks, small pieces of plasticene, or by other means.

In any case, the scale is attached in such a way so as not to obscure the particulars of the object's structure (those which might have a significance for the case). It is also important that the scale not buckle or be distorted.

The camera is positioned so that the major optical axis of the lens intersects the middle of the object being photographed. The back of the camera should be parallel to the plane of the scale.

The linear measurements of the object photographed are determined in the following manner: a coefficient (C) is calculated which shows the relationship of the real measurements of the object (Rm) to its measurements as shown in the photograph ($Ph.\ m$).

$$C = \frac{Rm}{Ph.m}$$

If the object has been photographed in a reduced form, the coefficient will be greater than 1. If the scale is that of natural size, then the coefficient will be equal to 1. And if the object has been enlarged, then consequently, the coefficient will be less than 1.

With the aid of a ruler, the representation of the scale (or a particular segment) is measured and the resulting value is divided by the actual size. The necessary parameter of the represented object is then measured with a ruler and this is multiplied by the previously obtained coefficient.

Example: the length of the scale shown in the photo is 5 centimetres, the real length of the scale is 100 cm. $C = \frac{100}{5} = 20$. The photograph shows a hole in a wall. The width is shown as 3.5 cm and the length as 4 cm. The actual width of the hole is determined as follows: $3.5 \times 20 = 70$ cm, and the actual length: $4 \times 20 = 80$ cm.

Reproduction Photography

Reproduction photography refers to the preparation of photocopies of flat (one-dimensional) images such as texts, drawings, blueprints, pictures and so forth.

The reproduction is done either with the help of an instrument fitted with a lens (such as a camera or enlarger), or by contact between the original to be copied and light-sensitive material.

Two types of reproduction arrangements are used: vertical and horizontal constructions. The former is characterised by the fact that the original is placed on a horizontal screen and the major optical axis of the lens is directed vertically. In arrangements of the second type, the screen is vertical, while the major axis is horizontal.

Criminal investigation uses a portable reproduction instrument with a vertical construction. It is composed of a basic screen, a rod with a bracket, a small-format reflex camera and two lights. The whole complex, when disassembled, fits into a suitcase. Often a vertical photomount is used which is fitted with a bellows-type view camera. Such a camera is usually intended for use with 9 × 12 cm plates or film.

The instruments of the second type — with horizontal constructions — are bellows-type view camera.

Its lensboard as well as its rear part, may be moved backwards and forwards. The object being photographed is held against a vertical screen by means of lamellate springs and glass plates. Lighting is provided by two lamps mounted on brackets.

Some reproduction arrangements are fitted with a pneumatic screen. This type of screen is a closed box whose upper part has numerous small openings. After placing the original on the screen, the air in the box is sucked out with an electric pump. In the resulting vacuum, the original is held fast and straight to the screen.

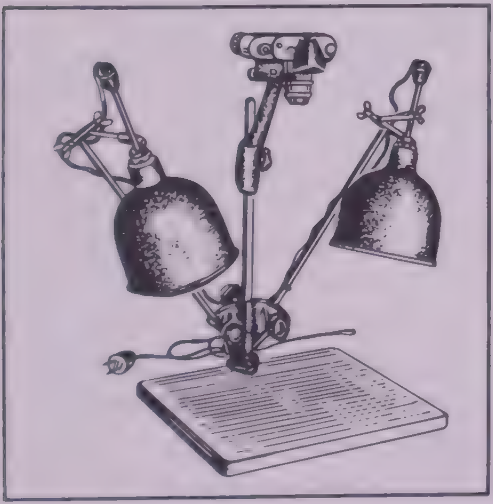


Fig. 8. Arrangement for reproduction photography of documents and photography to scale of real evidence

Often photographic reproductions are done with the aid of an ordinary camera. In these instances large-format cameras are the most convenient. If using a small-format camera it is recommended that one be chosen in which viewfinding and focusing is performed through a ground-glass. Insofar as a small-format camera allows for photographing at a distance of 65 to 100 cm and more, the representation of fine details at such distances is usually insufficiently clear. Therefore, when reproducing, the camera is used with an extender ring.

Depending on the format of the original, anywhere from one to four rings are used which, when placed between the camera body and the lens allow for the lens to be extended further. In this way, the functional segment of the camera is enlarged.

When reproduction is performed with the aid of a normal photographic enlarger, a cassette of black, light-proof paper is made which protects the photomaterial from accidental exposure to light. Exposure is regulated by engaging a light source which illuminates the original.

In order to guarantee a high degree of sharpness in the resulting image, black and white lined originals (texts, blueprints) are photographed with the aid of lined reproduction photographic plates, slide plates, phototechnical film and positive image films. Half-tint objects (photos, pictures) are photographed with half-tint reproduction plates and certain kinds of film.

Common photomaterial, especially contrastive and of fairly low sensitivity, is also suitable for reproduction work.

When reproducing, the camera is positioned so that its back is parallel to the screen, and so that the major optical axis transverses the centre of the original.

While composing the shot it is important to make sure that the image fills the entire frame, leaving only a narrow margin free along the edges.

The original is illuminated uniformly, from two opposing sides, taking care to ensure that there be no reflection off the glass covering the object. A sharp image is guaranteed not only by careful focusing, but by an aperture of 9 to 18.

The optimal exposure may be determined by the so-called "graduated exposure" method. This method is as follows: having opened the cassette, the entire plate is initially exposed for a minimal time-period (for example, two seconds). Covering a segment of the plate (for example, one-tenth of the entire surface), the remaining surface of the plate is exposed for the same time period (two seconds). Another one-tenth of the plate is again covered, and the open segment is exposed for a period of time two times longer than the initial time period. The remaining area of the plate is consecutively exposed, each time for a period two times longer than the preceding time period. In this way each segment of the plate is finally exposed with an exposure two times greater than that of the preceding segment. Once developed and fixed, the plate is examined under a strong light and the choice is made as to which

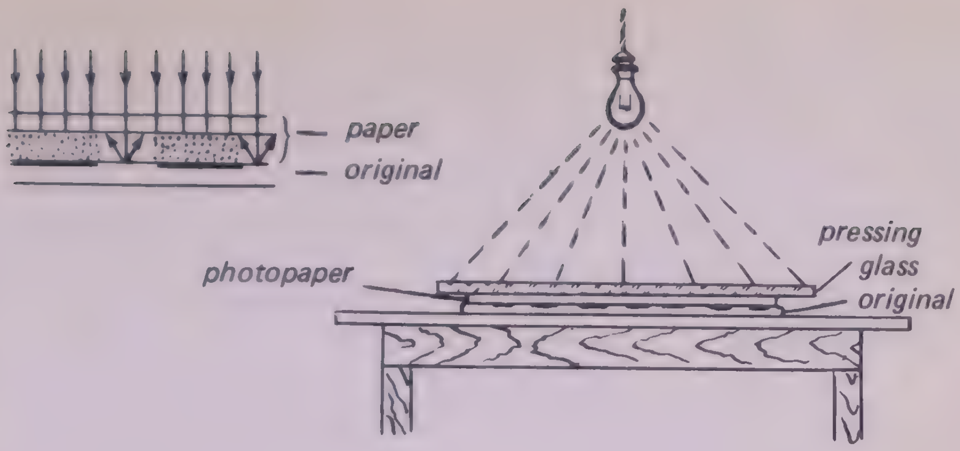


Fig. 9. Contact photography of documents

segment is the best in terms of its density. The exposure of that segment is then used for the final print.

The simplest method of coutact reproduction photography is based on the use of reflective photopaper. A reflective print is made under a very weak (diffused) regular light source, or under a laboratory light with a yellow or orange filter.

A sheet of reflective paper is laid on the object with the emulsion side towards the original. It is then held in place by a pane of clean glass and the exposure is made from the side of the photopaper. During exposure, a stream of light which is reflected off the light-coloured segments of the object acts on the light-sensitive layer of reflective paper. In order to produce such a photograph it is also possible to use a copying frame for printing.

A positive print is made by using reflective or normal contact printing. In the latter instance, regular photopaper is used, acted upon by light which passes through a paper negative. In order to enhance the transparency of this paper-based negative, it is possible to cover it with a layer of vaseline. For reflective printing, contrasting developers are used.

Criminalistic investigation sometimes uses various other means and methods of reproduction. Among these are methods based on the so-called "black-and-white diffusion transfer". The latter calls for the use of a set of materials which includes negative (light-sensitive) and positive (unsensitized) paper. The latter has a receptive layer which contains miniscule particles of metallic silver and hyposulphite.

The sheet of negative paper is placed on the original and exposed as for a reflective print. It is then brought into full contact with a sheet of positive paper and the two are processed with developer. During this process, segments of the negative paper, submitted to the effects of light, show the presence of crystals of metallic silver. The haloid silver on the unexposed and less-exposed segments reacts with the hyposulphite and diffuses into the receptive layer of the positive paper where it is reduced to metallic silver and consequently forms a positive image. A special device is used for exposure and developing.

Identification Photography

The term "identification photography" refers to that form of photography which is intended to record external features of living persons as well as of corpses for the purpose of criminal registration. Such photographs are also used for identification purposes by producing them for identification and submitting them to criminalistic expert examination.

Photographs used in the criminal registration process are produced in conformity with set rules: the face is photographed in full-face and in profile (from the right side). In the event that the left side of the head or face significantly differs from the right (e. g., due to the presence of scars, the absence of the left ear, etc.), it is recommended that an additional left profile be made.

The head should be in a strict vertical position. When a special chair (intended for use in such identification photos) is available, the correct position of the head is guaranteed by placing the subject in the chair with his back flat against the back of the chair. The back of the head is held straight by a special support. When such a chair is not available, the following simple device is used: in looking through the ground glass at the face of the subject, from the angle of the lens, the necessary position of the head is obtained by means of an imaginary horizontal line which passes through the corners of the eyes and "cuts off" the upper third of the ears.

It is advised that care be taken so that the hair not obscure the ears or other features. The face should be in a relaxed state (without smiles or grimaces). The photograph is usually done against a grey background under artificial lighting from two sources: one located behind the camera and the other to one side of the subject.

Registration photos are usually printed on a scale of 1:7. With this in mind, it is recommended that a small-format camera be used at a distance of one metre or more. While photographing, it is important to accurately measure a certain detail of the subject's face (for example, the height of the forehead from the bridge of the nose to the hairline). When printing, it is imperative to position the enlarger in such a way that the image of a given detail be reproduced at one-seventh its natural size. When using a large-format camera, the image in the necessary size is produced immediately onto the negative after positioning the camera at a distance equal to eight major focal lengths of the lens.

The photographs are attached to a sheet of cardboard or thick paper with the profile photograph to the left.

If it is necessary to establish the identity of an individual by presenting his photographs for identification, it is recommended that the photos be done in full-face, then in both profiles and at a three-fourths angle. In those instances when identification must include features of the figure, it is necessary to do photos in "full height", as well as those of a portrait type.

Insofar as those shots of the individual in question must be presented together with those of other (neutral) individuals, the latter must be represented in the same poses as the former. If it is impossible to obtain or prepare such photographs, then those available are limited to one specific pose, usually full-face or at a three-fourths angle.

When it is necessary to establish the identity of an individual through expert examination of a photograph, and if the individual who is supposedly pictured in the given photo is available for photographing, then it is advisable to take picture of him under the same conditions as were in effect during the preparations of the photograph under examination (i. e., tilt of the head, lighting, etc.). In addition, it is desirable to prepare other shots so that the expert might have at his disposal various representations: in full-face, both profiles and at a three-fourths angle.

The objects of identification photographs are corpses of unidentified individuals. The photographing procedure is usually preceded by preparatory work: at the suggestion of the investigator the forensic medical expert will stitch up wounds with the aim of bringing the external appearance into as close a resemblance as possible with that of the individual when he was alive. The expert may also perform a so-called "make-up" on the corpse: powder the face, colour the lips, etc.

A naked corpse is photographed after being covered with some sort of cloth. For photographic purposes the corpse is laid on a raised surface such as a table.

A series of photographs is then taken: in full-face, both profiles, and at three-fourths angle. It is, of course, wise to photograph any other body parts which may have characteristic markings such as scars, birthmarks, tatooes, etc.

3. Methods of Investigative Photography. Microphotography

The term "microphotography" refers to the type of photography used to uncover and fix the microstructure and microrelief of objects under investigation. Microphotographing with a small magnification may be performed using a camera where the distance between the lens board and the surface of the negative material (the functional segment) is a few times larger than the main focal length of the lens. An ordinary camera may be adapted for use in such photography. The most convenient cameras in these instances are those with a focus on ground glass. Small-format cameras with a viewfinder or metric scale should be used in conjunction with a special attachment which has ground glass. The functional segment is enlarged by means of an extension or rigid tube placed between the lens and camera body. The length of the rigid tube is calculated, depending on the desired scale of signification, using the formula $\triangle F = F \times s$, where $\triangle F$ — the length of the tube, F — the main focal length of the lens and s — the scale of the image, i. e., the figure which shows how many times larger the linear size of the image is than the actual size of the object.

If there is no ground-glass attachment, then sharpness of image may be guaranteed by using rangefinders or distance ranges and the corresponding placement of the camera at a specified distance from the object. In this case it is recommended that the indicator on the rangefinder (scale) be set at (infinity) and that the camera be placed in such a way so that there be a distance between the object and the back wall of the camera which is determined by the formula:

$$D = d + F + \triangle F + 3$$

where D — the distance between the object and the back wall of the camera, d — the distance between the object and the optical centre of the lens, F — main focal length, $\triangle F$ — the length of the tube, and 3 — the approximate distance from the surface of the film to the back wall of the camera, in millimetres. The value of d is easily determined by the formula:

$$d = F\left(\frac{1}{s} + 1\right).$$

Microphotography with significant magnification is a method of photographing through a microscope with the aid of a normal camera (with ground-glass, or fitted with such an attachment), or by means of microadapters or photomicrographic cameras.

If using an ordinary camera, the lens is removed and, with the help of a universal clamp, the camera is mounted on a bar (either of an enlarger, or one which has been specially made). The camera is then connected to the eye-piece of the microscope in such a way so as to provide a light-tightness. When using a small-format camera, the lens opening is fitted with a specially designed metal tube, 3-4 cm high. To this ring a cloth tube is attached with rubber bands, one end on the metal ring, and the other on the tube of the microscope.

The microscope is then positioned so that the image appears in the centre of the ground-glass of the camera. The range-finder may be moved to regulate the scale of the image. The greater the distance between the eyepiece of the microscope and the lens opening, the larger the image.

Focussing is done by using the focus-ring on the microscope. In order to produce a sharp image, the photomicrographer is placed at a relatively short distance from the object being photographed. Sometimes it will not be possible to position the lens at the necessary distance from the object (for example, when photographing the bore of a gun barrel). In such instances it will be necessary to use the method of "telescoping focussing". This demands the use of an additional lens which is attached using a special coupler which is fitted onto the microscope to replace the condenser lens which is removed together with the mirror. Light reflected off the object passes through the added lens, through the microlens and the eye-piece of the microscope and onto the ground-glass of the camera. When using the telescoping focussing method, it is possible to take pictures at distances ranging from a few centimetres to a few metres.

When microphotographing, the light source must be sufficiently strong and even. The same light sources are used as are used in microscopy.

In order to best show up the microrelief of the object, the light is aimed at a sharp angle from the top of the object and perpendicularly to those details having linear form (for example, scratches).

To avoid the possibility of acute shadowing a second light source is used which is either feebler than the first, or placed slightly further away from the object than the first and aimed from the direction of the shadows.

It is helpful to use a reflecting screen in instances where shadow formation is possible. The screen may simply be a sheet of white paper or cardboard. The light rays are then reflected off the screen and directed toward the object in order to soften any shadows produced.

Microphotography under available light is done through a microscope. This is best for contrastive photomaterials with a high resolution.

Exposure time is determined using a system of trial and error. If using a press camera, exposure is best determined using the "graduated exposure" method.

Contrastive Photography

The term "contrastive photography" refers to the kind of photography used to highlight acute contrasts (the variations in brightness) including shadow contrasts which are a result of shadows caused by details of the relief.

This type of photography, among other things, allows to reveal unseen and barely visible details (those which have been erased, chemically removed or have faded) in texts and documents.

The simplest of these methods is one which uses contrastive, particularly contrastive and highly-contrastive materials (lined, slide film or phototechnical films). These materials are then processed in a contrastive developer.

Additional intensified contrast is obtained by using a superstrength booster such as mercury.

A more complex method of contrastive photography is *contratype*, that is, the consecutive preparation of a series of negatives and slides. The object is photographed on contrast, high-contrast and super-contrast material which is then processed in a contrastive developer until a medium or slightly reduced density is obtained. A slide is then made from the resulting negative using a contrastive photoplate (lined, reproductive or slide) which is in turn processed in a contrastive developer.

Using the contact method, a second negative is made from the slide, and from the resulting negative, a second slide, and so forth. The operation is repeated until the desired contrast is achieved.

Insofar as this reproduction (recopying) leads to an intensification of even the most insignificant differences in the densities of various segments of the negatives (ones which are the result of uneven lighting), it is imperative that shooting be done under uniform lighting, using at least two light sources mounted on opposing sides.

Another method of contrastive photography is to make a print from the superposition of two negatives of the same object. In order to obtain the second negative, the plate is inserted into the camera so that the emulsion side should face not towards the objective lens, but away from it. Having done this and after focussing, the body of the camera is moved back to a distance equal to the thickness of the plate. The negatives are combined, emulsion sides together, so that the two images coincide. They are then sealed along the edges. A print is then made from the combined negatives using an enlarger.

Photographing with a Light Filter (Colour differentiation)

Colour differentiation refers to the kind of photography which uses a light filter in order to transform variations in the colour of specific parts or details of a given object into variations in brightness, while simultaneously enlarging or reducing these variations. The given method makes it possible to intensify a barely visible text, to uncover additions written into a document or to read a note which has been obscured with some sort of dye.

The light filter is attached either directly on to the objective lens, or mounted in front of the lens on a special stand. The filter is chosen with an eye towards the characteristics of the object to be photographed as well as to the goal of the photographic examination. For this, a colour-wheel is helpful. Those colours at opposite ends of the spectrum are considered supplementary (that is, when fused optically, they give the impression of the white colour).

If it is necessary to intensify a notation made with coloured dye on a light, non-coloured (achromatic) background, the photograph is done using a filter whose colour is supplementary to that of the lines, or of a colour located next to it on the colour-wheel. For example, yellow lines on white paper must be photographed using a dark blue, light blue or violet filter.

To intensify a coloured detail on a grey or black background, the detail is photographed using a filter whose colour is that of the detail, or one which is located near it on the colour-wheel. To reduce the contrast, a filter of supplementary colour is used.

If it is necessary to photograph a coloured detail on a coloured background and, simultaneously, to intensify the contrast, a filter must be used which is of a colour supplementary to that of either the detail or the background.

When it is necessary to differentiate two details of the same colour (for example, the lines of an original text and those added later), a filter is used which is of the same colour as the details, or of one of the colours near it on the colour-wheel. In the presence of even the smallest variation in shades, the images (in the print) of the details will appear unequal as to their density.

The photography is done on photomaterials which are sensitive to those rays which the chosen filter allows to pass.

The best results are obtained by using photomaterials which intensify the capabilities of the light filter. The optimal combination of filter and materials may be determined through experimentation, by making a series of shots on various plates and films, using various filters.

Focussing is done on the ground glass with the chosen filter put on the lens. If, due to the density of the filter, the image is poorly visible, then focussing is done with a less dense filter, but of the same colour. It is advisable to select an aperture from 9 to 18.

The exposure is usually determined by trial and error, using a few plates or frames. The method of "graduated exposure" is used when photographing with plates.

Ultraviolet Photography

When photographing in ultraviolet rays, the image is produced due to the action of these rays on photopaper as they are reflected off the object, or by visible fluorescence induced by the ultraviolet rays.

In reflected ultraviolet rays of a wave-length from 400 to 340 nanometres photographs are taken with a normal glass lens. If the wave-length is less, a quartz or mirror-lens is used, as plain glass absorbs, to a significant degree, this radiation. An ultraviolet filter is placed in front of the lens and lighting is done using analytical fluorescent lights.

Insofar as the focus of ultraviolet rays is located closer to the camera lens than the focus of visible light, the body of the camera is moved slightly closer to the object after focussing in visible light. The size of the correction in focus is the greater the larger the scale of the image and the shorter the wave-length of the ultraviolet rays permitted by the filter. This is usually determined by trial and error.

When only one variable is present (the scale of the image), the size of the correction is determined using a corrective coefficient. This is computed in conformity with the determined combination of lens and filter. Computation is done using the formula $C = \frac{Fuv}{Fvl}$ where Fuv — the focal length for the ultraviolet rays permitted by the filter and Fvl — the focal length for the visible light. The focal length for the ultraviolet rays for the given scale is determined by multiplying the corrective coefficient by the focal length for the visible light (as determined after focusing with the help of ground glass).

Supplement correction in focussing may be done using the aperture.

When photographing in reflected ultraviolet rays photomaterials mainly of the type "non-sensitised" (slide plates, "positive" films, so-called "micrat" or phototechnical films) are used.

Fluorescence photography records the visible light given off by certain substances when they are irradiated by ultraviolet rays. Normal lenses are used. In this case, the ultraviolet filter is placed not in front of the lens, but in front of the analytic light. A so-called "screening-out filter" (either glass or celluloid) is placed in front of the lens to transmit only the reflected ultraviolet rays. This filter is of a colour which is conducive to precisely record the illumination. The filter is chosen according to the rules of colour-differentiation photography.

Infrared photography

Infrared photography refers to the process of shooting a heat-radiated object. It allows for the detecting of certain peculiarities which are due to variations in the absorption of infrared rays by various materials. One such example is a text which has been written in pencil and then covered by aniline ink.

This type of photography can be done with any ordinary camera. An infrared filter is mounted on the camera lens and the object is illuminated by normal incandescent lights.

One of the particulars of this type of photography is its use of photoplates or film called "infrachrome" which are sensitive to infrared rays. It is imperative that the absorbing capacity of the filter correspond to the spectral sensitivity of the photographic material being used.

Insofar as the focus of infrared rays is located farther away from the camera lens than the focus of visible light, the distance between the lens and the plate is slightly enlarged after focussing in visible light. It is recommended that the object be photographed more than once, making various corrections in the focus, and then the sharpest of the resulting shots be chosen. Satisfactory results may be obtained by focussing on ground-glass with a red filter fixed on thedens and using a small aperture.

Exposed "infrachrome" materials are developed in a dark room under the light of a lamp fitted with a special dark-green filter.

Infrared photography is used in criminal investigation, particularly when uncovering etched or erased notations, or revealing additions to original documents. This method is based on the capability of certain substances to give off infrared rays when illuminated with rays of the blue-green zone of the spectrum. The object is illuminated by two fairly powerful sources (for example, klieg lights) fitted with blue-green filters. The camera lens is fitted with an infrared or dense red filter.

Radiography

This method of photography is a means of producing a shadow image due to the action of X-rays on photomaterial as they pass through a given object.

In criminal investigation this method is used to study the internal structure and condition of segments of firearms, ammunition, locks, seals and to locate hidden metallic objects. It is also used to determine damage at points of entry of bullets, to read various texts which have been obscured by dyes and to reveal notations done in invisible inks (especially those which contain chlorides of heavy metals).

Depending on the characteristics of the given object and the aim of the photo, a source of either "softer" (less penetrating) X-rays or "harder" (more penetrating) X-rays is used. Photographing is done either on special X-ray film, or normal negative photomaterial.

When using "harder" X-rays, the photomaterial may be wrapped in black paper, the kind used to package photographic plates and paper. If using "softer" X-rays, the material is placed in a special metal cassette, one side of which is aluminum foil.

The given object is placed on the prepared casette, (paper or metal) and treated with the X-rays. The shadow image becomes visible after laboratory development of the exposed film.

Gamma-Rays Photography

This type of photography (gammagraphy) produces a shadow image owing to the action of the gamma rays on photomaterial as they pass through the given object.

In criminal investigation, gammagraphy facilitates an examination of the internal structure of metallic objects such as firearms, ammunition, locks and seals. To produce a gammagram, a metallic cassette (like the ones used in radiography) loaded with X-ray film, is used. The cassette (foil side up) is laid on a table, and the object to be photographed is placed on the cassette. A container with the radioactive isotope Co^{60} (the source of the gamma rays) is suspended above the object on a special bracket. After the gamma-rays have passed through the object and the wall of the cassette, they expose the photomaterial and produce a shadow image on it.

Insofar as both X-rays and gamma-rays pose a health hazard to the human body, it is important to observe certain safety precautions when working with these rays.

4. The Application of Photography to Investigative Activity

Often photography is used in the course of *investigative examination*. In these instances, objects to be photographed may be: scene of an event as a whole as well as in part, corpses, tracks and other real evidence.

Photography done on the spot, at the scene of an event, may be of various types: orientation, survey, nodal and detailed.

Orientation photography refers to the type of photography done in order to fix not only the scene of a crime, but its surroundings as well. An example would be the shot of a store which was the scene of a robbery, together with the neighbouring buildings and the paths of approach to the location. When investigating crimes involving transport, orientation photography often fixes the road segments which lead to the scene, as well as road signs, fences, nearby structures, etc.

Survey photography refers to the photographing of crime scenes without the surrounding environment. Under such circumstances the camera is placed, as close as possible, to the point from which the entire scene is visible, or at least its greater part. Usually series of photos are done, from two or more opposite sides. In such instances it is recommended that any conspicuous details be represented in a number (at least two) of photos. This makes it possible to determine the relationship between the photos and to compose a more correct representation of the correspondence of the locations of various objects on the scene.

Nodal photography refers to the type of shot which shows individual areas of the scene of the crime where the largest quantity of real evidence is concentrated (for example, the location of a corpse, the remains of a fire, etc.).

Detailed photography shows individual traces and objects usually in large scale and often with an accompanying measuring scale.

When shooting on location, it is important to keep in mind that the most precise and informative photographs are produced when the sun is to one side of the camera.

If it is necessary to shoot certain premises which are lit by direct sunlight, it is recommended that the windows be covered with gauze and the exposure time be changed to correspond to a darker setting.

Often a scene of the crime is illuminated for shooting with an electronic flash. If the scene is too large for a single flash to be effective, it is recommended that the camera be set on a very long exposure, the shutter then be opened and the necessary number of flashes be made. In doing so, it is necessary to reposition the electronic flash, changing the direction of the light source, and finally closing the shutter.

Crowded conditions in a small setting are photographed with the aid of a wide-angle lens.

Corpses are photographed in a number of ways. Initially, the corpse is photographed from a number of angles, each time including the surroundings. This is done by positioning the camera in such a way so that those surroundings having relevance to the corpse are the main focus of the photograph. The actual representation of the corpse occupies a relatively small part in each such frame. Afterwards, the corpse is photographed separately, and attempts are made to show the position of the corpse and its external appearance: any exposed parts of the body as well as clothing.

Separate pictures of the corpse are usually taken from two opposing sides, placing the camera in such a way so that the main optical axis of the lens is perpendicular to the lengthwise axis of the corpse. In addition, it is recommended that the corpse be photographed from above, pointing the camera lens downward (a vertical shot).

A corpse which is located in very crowded surroundings is photographed with either a wide-angle lens, or using a "panoramic" technique of shooting.

A panoramic picture usually consists of two parts, one of which shows the upper segment of the corpse, with the other showing the lower one.

Characteristic details which show wounds, scratches (abrasions), bloodstains, damage to clothing are photographed separately, in enlarged form, with an accompanying millimetre scale.

Corpses which are found in an unusual state (dirty, frozen, disguised or camouflaged, etc.) are first photographed in their initial state and then again after they have been returned to a normal state (after cleaning done by a forensic medical expert, thawing or unmasking).

An unidentified corpse is photographed in accordance with the rules of identification photography.

Such *real evidence as traces and objects* are photographed in such a way as to show where they were uncovered, their interrelationship (in terms of location), their general and specific external features.

Initially those traces and objects are photographed which are concentrated in a specific area of the crime scene. Any traces which are spread out over a significant area (such as footprints) are photographed using a panoramic method. A choice is then made as to which details (of an identical type) are most complete and distinct. These are then photographed separately, with an accompanying millimetre scale.

Barely visible *handprints* (the result of sweat and/or body oils) on glass, plastic or other glossy surfaces are best photographed in a darkened setting, using a camera with a ground-glass, on a scale of 1:1. Such handprints are also photographed using a small-format camera with the aid of extension rings. To avoid harmful reflection from the flash, it is wise to lay a sheet of black paper, with a portion cut out, directly on the trace (as a sort of "mask"). It is recommended that illumination be from the side, in a thin beam. Such lighting i- easily obtained by fitting the reflector of the lamp with a cone of black, light-resistant paper.

If the trace is on a transparent surface, then it is wise to lay a piece of black cloth or paper a short distance from it, on the opposite side.

Any trace on a glass surface may be photographed using available light. In such instances the glass is held vertically by a clamp and the "mask" is then attached. The camera is placed opposite the glass, on the side of the trace, with a black screen behind it and the light source originating from the side. The light is directed toward the glass at an angle of 45° to 60°.

Invisible handprints and perspiration marks are photographed after being dusted, or after being similarly treated, in accordance with the parameters of reproduction photography.

Volumetric *footprints, tiretracks or traces left by tools used in a forced entry* are photographed using two light sources; one placed near the camera and the other to the side of the trace. The first source guarantees a precise rendering of the general outline of the trace while the second shows any characteristic peculiarities in the structure of the object responsible for the traces. The light source positioned to one side is placed in such a way that the light falls perpendicularly to the image of the trace's linear characteristics. The best position is determined by trial and error. Insofar as certain characteristic peculiarities may be orientated in various directions, it is convenient to make a series of photos, each time positioning the light source anew.

It is also possible to photograph traces using only one light source. To avoid unnecessary shadows which are often formed in deep traces, reflective screens are used which consist of sheets of white paper or cloth attached to frames. The screens are placed on the side opposite to the light source. Tracks in snow should be photographed using side lighting and a yellow or orange filter.

Objects of real evidence should first be photographed where they were uncovered, and then against uniformly contrasting backgrounds. In order to avoid deep shadows along the perimeter of the object, a sheet of paper or cloth, serving as a backdrop, is spread out. Then a sheet of clean, clear glass is placed on a stable stand positioned a short distance away from the backdrop. The object to be photographed is placed on this glass.

When photographing the surface of an object to show structural characteristics, a millimetre scale is used. As when photographing volumetric traces, a combination light source is used. One source is direct, which allows for the precise recording of the outer contours of the object. The second source is from the side and it underscores the object's superficial structure and any features having a raised character.

In addition to the general appearance of real evidence, separate, close-up shots are taken of any characteristic features such as trademarks, labels, monograms, code numbers and any evidence of damage.

Photography is often used in the course of *investigative experiments.*

During an experiment to determine whether or not it was possible for an individual to enter through an opening in a broken wall, photographs are taken from two opposing sides: from inside the premises and from the outside. In this way the photos will show the initial external condition of the opening as well as its condition after the experiment has been completed. When conducting an experiment to determine whether or not it was possible to see the events from a specific vantage point, photographs are taken which include everything which falls into the field of vision from the given spot.

In the course of an experiment to determine the possibility of placing a given quantity of objects within a specific, limited area (for example, in the body of a car), the objects themselves are initially photographed. Then photographs are taken of the objects after they have been placed in the given area, as well as of those which did not fit.

Photography is also used when *producing individuals and objects for identification.*

It is recommended that initially the group of individuals or objects produced for identification be photographed in their entirety, then separately. The individuals who were identified should be shown in both full-face and profile, while objects should be shown close-up, with an accompanying measuring scale.

When it is impossible to produce the actual object or individual for identification, it is permissible to conduct the identification process using photographs. Photos of a given individual are presented together with photos of other individuals who do not significantly differ, in terms of their external features, from the individual to be identified. There should be no less than three such "neutral" photos. It is recommended that steps be taken to procure photographs of the given individual in differing poses and positions (head only, of course). Each of the "neutral" photos should show similar positioning. Each photo is then mounted on a separate sheet of paper and numbered consecutively.

If it is necessary to identify a given object, it is photographed among no less than three other similar objects. Before shooting, a sheet of paper bearing an ordinal number is placed before each object.

When verifying evidence on location, photographs are taken of those segments where, according to testimony given, certain events took place, various traces or objects were found, etc.

During *search* procedures, photography is used to record hiding places (caches), real evidence, which has been uncovered and removed, as well as objects removed from civil turnover.

The use of photography is indicated in reports relating to investigative activity. Such reports name the object photographed, refer to the type or model of camera, the type of lens used, under what lighting conditions the object was photographed, the spectral sensitivity of the emulsion, the kind of filter (if any) used, as well as the actual method of photographing.

Those points where the camera was located during shooting should be fixed on a plan or map, using ordinal numbers which correspond to the numbers on the resulting photographs.

If, owing to mistakes made during the shooting, it becomes impossible to produce photos, a document attesting to this fact is prepared, verified by the investigator and attached to the file.

The photographs are accompanied by explanatory texts. It is wise to indicate in these texts the object photographed, the name of the case and the date of the investigation. The report to which the photograph is appended should also be indicated.

In instances where numbered tables are used to catalogue characteristics of objects, they should be explained in such a way so that it is clear, to what each number refers. Such explanations are equally necessary where characteristics are marked by arrows drawn directly on the photograph.

These explanatory texts are written directly on the back of the photograph or on a sheet of paper to which the photo is attached. In the latter instance, the photo is verified with a stamp whose impression lies partially on the photo itself.

5. The Use of Motion-Picture Photography in Investigative Activity

The purpose of motion-picture photography used in the process of preliminary investigation consists primarily in the reflection of the character and consequences of a given action.

Motion-picture photography is usually done on the orders of the investigator and by a trained cameraman.

Before beginning, the objects to be recorded are indicated and, in complex situations, it is important to become well acquainted with the crime scene. It may also be helpful to compose a systematic (frame by frame) plan of the shooting which will provide for each necessary episode, the relative length of each, their order of shooting and the necessary methods.

Corresponding to the division of forensic photography into orientation, survey, nodal and detailed, motion-picture photography combines close-up with median and long shots. In order to guarantee the best perception of the connections between images of various scales, a smooth transition from one plane to the other is necessary. With this in mind, the variable-focus lens (zoom), allowing for a graduated change in focussing distance, is used. If such a lens is lacking, it is compensated for by repositioning the camera towards the object (focussing in) or away from it (focussing out).

In certain situations a panoramic film is produced, either linear or circular. An object which extends horizontally is filmed using a smooth repositioning of the camera along a line parallel to the foreground. For vertically extended objects, the camera is rotated around a horizontal axis in such a way so as to allow the lens to travel slowly from bottom to top.

A circular panorama is produced by smoothly rotating the camera around a vertical axis with the aid of a tripod mount. If it is necessary to represent an object from all sides (for example, a burning building), the camera is repositioned around the object. The method is usually referred to as "circumvention".

When shooting, each episode should take the normal amount of time so that a viewer could see all that has been photographed.

Motion-picture photography is used most frequently when conducting investigative experiments and in verifying evidence on location.

Often motion-picture photography is used to record experiments conducted to determine whether or not it was possible for the accused to perform one or another given action (such as entering through a break in a wall, preparing counterfeit currency, etc.).

Filming in the course of the experiment is done, if needed from a number of differing angles. For example, in order to verify whether or not it was possible for a given individual with a given build to enter through an opening in a wall, film is made from the outside as well as from the inside of the location.

Experimental activity performed at a quick pace should be filmed at a higher speed (for example, 48 frames per second) and then shown at normal speed (24 frames per second). The result is that the action filmed is then seen on the screen in slow-motion, which makes perception and analysis easier. In those instances where the action itself takes long time, it is possible to resort to shooting at a slower speed.

Motion-picture photography is a reliable method of recording the course and results of *verifying evidence in situ*. When verifying evidence in an open space, the moment when the individuals involved in the investigation arrived at the scene is usually recorded. This allows for the verification of whether or not recommended tactical procedures were observed. Such procedures call for the individual, whose testimony is being verified, to walk at the head of the group.

Besides, the individual whose testimony is being verified is also filmed when giving any sort of explanation. Also filmed are objects or areas, indicated by the individual, of the location where an incident occurred (a murder, mugging, etc.).

Motion-picture photography is also used when producing *evidence for identification*. For this, two types of movies are used. One records the course and results of producing the evidence in real life. The second is used when it is impossible or significantly difficult to perform such an action.

In the first type, all individuals involved in the given investigation are filmed. When identification is made, the individual identified is filmed separately from the others, in full-face and in profile.

When conducting identification with using film, the individual in question should be filmed in a group of no less than three other individuals who do not significantly differ from the former in terms of their external appearance. The individuals in the group should be filmed in the following manner: (a) standing, sitting and walking, shoulder to shoulder, approximately 50cm apart; (b) in single file, filmed from the side (again sitting, standing and walking); (c) positioned freely and filmed during an improvised discussion.

In some instances it is wise to film during the examination of the scene of a crime. Such a tactic is justified in those situations where the event under investigation is ongoing. One such example might be a fire which is still burning after the arrival of the investigator. Having taken the proper measures to extinguish the flames (if such measures have not already been taken), the scene is filmed.

Filming of static conditions on a crime scene is done in those instances when they are extremely complex, or when they may be preserved for only a short time. Examples of the latter might be the necessity of clearing a road after a traffic accident or the threat that traces might disappear due to unfavourable weather conditions.

Filming is necessary during a search in order to record the activities of the individual being searched at those moments when a cache of valuables is located, when it is opened and when the objects hidden therein are removed.

The use of motion-picture photography is described in records in regards to what objects were filmed, what shooting techniques were used, the type or model of camera used, the speed of the filming, the quantity of film used, the name of the individual responsible for the filming, as well as his official title.

If more than one reel was filmed, a montage of the individual films is usually made.

The film should be accompanied by explanatory notes. When sound-track is magnetic, a commentary may be recorded by means of a tape-recorder. If silent film is used, explanatory t xts are added as titles or subtitles. The texts are either typed, written by hand in black ink or composed of press-on letters. The texts are filmed in a time frame sufficient for their reading and are then edited into the film.

The resulting film should be shown to all those witnesses who were present when the corresponding investigative action was carried out. The report of the case should contain a short synopsis of the content of the film, the model of the projector used in viewing, the projection speed, the running time of the film and a record of any comments made after the viewing. The report should be signed by the investigator, expert and witnesses.

CHAPTER VIII

TRACEOLOGY

1. The Meaning of Traceology and Its Significance in Detecting Crimes

Traceology is a branch of criminalistic technology, a system of scientific tenets and their corresponding technological devices and methods of uncovering, recording and examining material traces with the aim of detecting a crime.

When many crimes are committed, certain changes often occur on the scene which are usually referred to as "traces" (of a crime). In order to elucidate the circumstances of a given event, the investigator will use such traces. But often he will find it necessary to turn to specialists for help. These are individuals in various fields who use their knowledge of various sciences and technologies in order to, for example, determine the nature and composition of an object which produced a certain trace.

Together with the preceding, forensic study of traces has revealed the need for scientific elaboration of specialised means and methods of studying traces.

In criminalistics, the term *trace, in a broad sense*, refers to any resulting material changes in the initial environment following the commission of a crime. These are traces as representations, objects or their component parts, various substances, or an altered relationship between the placement of objects.

In a narrow sense, a *trace* is a materially-fixed representation of the external structure of a given object on another. It may also be any layering, exfoliation or other similar results of mechanical, thermal, chemical or other processes which do not affect the outer surface of the object being acted upon.

The examination of a crime scene will often reveal handprints, footprints, tracks made by vehicles, traces left by tools used in a forcible entry, and so forth. Studying these traces, it is possible to hold an inquiry into the crime and expose the criminal. Thus, it is possible, by studying footprints, to determine the criminal's point of entry onto the scene, to reveal certain peculiarities of his gait, to determine shoe size and to identify the shoes themselves. Fingerprints will often facilitate the specific identification of the individual who left them.

The technical devices and methods of traceology are elaborated on the basis of the following scientific tenets.

Objects Belonging to the Material World are Individual and Unique. As has already been noted, all material objects are identical only to themselves. In other words, each object is unique. Many objects resemble each other in terms of certain external features, but the entirety of their traits makes each object unique. Of particular importance are those individual features which have relevance for traceology. Specifically, these are features of the external structure of one or another segment of the given object. There is no such thing as a completely smooth surface. Any given surface will have some sort of irregularity (roughness, unevenness); bulges and cavities which differ in terms of their shape and size and which may be differentiated by their placement.

Under certain circumstances, the external features of a given object may be reflected on another object. When this occurs, not only the form and size of the object are reproduced, but often the microstructure of its surface.

The resultant impression of an object's external features as contained in a trace may be used to identify the trace. This is done by isolating individual groupings of traits (as represented in the trace) and comparing them with the features of an object which has been suggested as being capable of leaving the given trace.

The possibility of identifying an object by a trace is conditioned by the completeness and precision of the impression on the object's surface, owing to the manner in which the trace was produced. In this way, the most important factors are the physical compositions of the substance containing the trace and of the object which left the trace, as well as the interaction between the two.

A trace shows an object's external features as transformed. The impressions of the object's features contained in the trace is always "negative", as it relates to the features themselves. Therefore, when pressing one object against another, the bulges in the trace correspond to the cavities in the object, and vice versa.

Depending on the manner in which the trace was produced, it is possible to find other types of transformations. For example, convexities on the object responsible for the trace may be reflected as scratches.

Traceology examines only those objects whose composition is fixed and which are relatively non-variable. Traceological identification is possible only when the traits of the object which produced the trace, and the impressions left are not significantly altered within a specific period of time. Only hard objects (which have a relatively stable external structure) change very little, in practical terms, for a long period of time after making an impression. In this way, these objects preserve that information which is necessary for investigation. This makes it possible to identify an object during a certain period of time after an impression has been made.

2. Types of Traces and Their Formation

Traces which are the objects of traceology are usually formed during immediate contact between two objects. The object upon which the impression was made is called the *receptor* and the object which made the impression is called the *producer*. Those points on the objects' surfaces which come into contact during the impression are called the *contact surfaces*.

Impressions which may be materially established may be produced by various interactions of the objects. The totality of these conditions is referred to as the *mechanism of trace formation*.

Practice and experimental research have shown that the factors which most significantly affect the process of impression are the character of the movement of the objects (relative to each other) as they come into contact; the make-up of their individual substances, as well as the character and location of the alteration which is the result of the objects' interaction.

Those traces studied in the science of tracing are divided into the following groups: static or dynamic; volumetric or superficial; localised or peripheral.

A trace is produced only when complete contact is made between two objects. Such contact may be made either when both objects are in motion, moving towards each other, or when one object is in motion, moving towards the other. If the objects are in motion (relative to each other) only along the normal[1], their contact surfaces along the tangent, at the moment of impression, do not meet (as at a pressure point, or as a result of movement from a blow). In such an instance a *static trace* is produced, or a so-called *impression* or *imprint*. If the objects are moving along both the normal and the tangent (as during slipping, cutting or chopping), the resulting trace is termed dynamic.

In a static trace the characteristics of the contact surface on the producer are preserved usually without significant alteration. Owing to this, it is possible to determine the shape and size of this object. Individual features of the external structure also do not undergo significant alteration. This also enhances the possibility of identification. Examples of such traces are shoeprints in cement or fingerprints on various objects.

A variation on the static trace is the impression made by *rolling*. During such contact, in spite of the general parallax of the objects, their contact surfaces do not move, relative to each other. The surface responsible for the impression rotates. An example of such a phenomenon would be the impression left by tire treads.

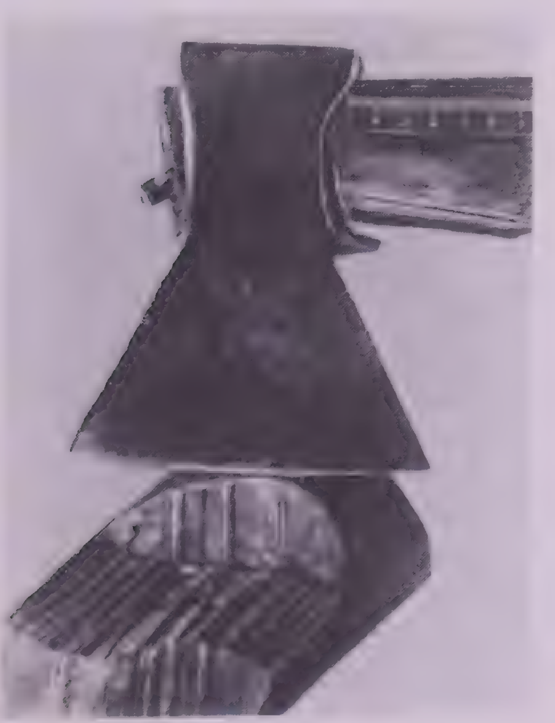


Fig. 10. Trace forming mechanism (cut trace)

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[1] Normal (math., phys.) — a vector which runs perpendicularly to the surface of an object.

In a dynamic trace, the peculiarities of the surface of the producer are reflected with significant alterations: in the form of lines (scratches) with varying widths and depths. In such traces it is usual to observe only the impressions left by the most prominent features of the external surface of the producer. This is due to the fact that traces of finer details are often covered over by the traces of the more prominent ones. The inter-disposition of the impressions left by the producer contained in the trace may change according to the angle at which contact between the surfaces is made. In examining a dynamic trace, it is not always possible to determine the size and shape of the producer, but its identification is possible. Examples of such traces are marks left by chopping, cutting or slipping (see Fig. 10).

Traces on the surface of the receptor are divided by the characteristics of their alterations into groups of volumetric and superficial.

Those traces which are the result of a deformation by the producer and are present in three dimensions (length, width and depth) are called *volumetric*. They are formed in such substances as cement, metal, wood or clay when an object (such as shoes, automobile tires or tools) is either pressed into the surface or used to strike it. Such traces usually contain sufficient information about the producer to determine the group of objects to which it belongs, as well as to ascertain its individual identity.

The quality of the trace depends on a series of physical factors pertaining to the nature of the receptor's surface: the more elastic its surface and the finer the elements of its structure, the more precise and distinct will be the representation of the producer's finer features. For example, a soft, fine-grained metal surface will show the traces of tools used in a forcible entry more clearly and completely than will a wood surface which has a crude structure.

Traces which are the result of surface alterations in the receptor (such as layering or exfoliation) and which are characterised by length and width, are termed *superficial* (or flat).[1] These traces are formed either when a segment of the producer is detached and attached to the surface of the receptor or when the opposite occurs. In this way, traces of layering and exfoliation are differentiated.

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[1] These designations are conditional. Such traces may also have a third dimension. All the same, the depth and height of the relief elements are so insignificant that it is possible to ignore them.

Typical examples of superficial traces are human fingerprints on hard surfaces, shoeprints on a floor and tire tread marks on a road with a hard surface such as asphalt or concrete.

Depending on the location of the alterations in the receptor's surface which produce the trace, superficial traces are divided into localised and peripheral groups.

Localised traces are produced as a result of alterations in the surface of the receptor at the point of contact. *Peripheral traces* are located beyond the parameters of the contact surfaces. The former include traces which have been produced by dirty soles, whereas the latter include those footprints made by clean soles with a soiled upper surface. These traces occur when the upper surfaces of the footwear are covered with any kind of free-flowing dry substance such as flour, cement powder, etc. When the foot is sharply placed down, particles of the given substance may sift down and form an outline of the shoe.

Most often the science of tracing studies human hand and footprints, fingerprints, traces made by footwear, tools used in a forced entry, vehicles, human teeth and nail marks.

3. General Rules for Examining, Recording and Removing Traces

Uncovering Traces on the Scene of a Crime and the Specifics of their Examination. Traces may be found on various segments of the crime scene. Therefore, when searching for traces it is important to take into consideration the conditions of the scene, the characteristics of the surface of the receptor as well as the nature of the producer. Thus, fingerprints are most often found on doors near any bolts or locks, on door handles and on glass or lacquered surfaces. Footprints are most often uncovered at those places where entry might have taken place (such as near an entryway, in a corridor by a window, near fences, etc.).

Once uncovered, measures should be taken immediately in order to preserve the traces until they may be removed. It is recommended that they be covered with some sort of improvised cover (such as a plate, bucket or box).

A crime scene will often yield several traces made by similar objects (shoeprints) or by various segments of a single object (for example, traces of chopping left by different parts of an axe blade). As a rule, all traces should be removed from a crime scene. As has been proven in practice, even the most incomplete and indistinct traces may serve as material in an investigation insofar as their totality may give a more exact representation of the object responsible for the trace.

When examining the scene, it is imperative to carefully search for all traces made by various objects: hands, fingers, footwear, tools used in a forced entry, etc. An examination should not be considered complete until the investigator has attempted to find vehicle tracks if he suspects that the criminal removed the stolen property by car.

When investigating the scene, it is important to determine whether or not the production of the traces was accompanied by sawdust or metal filings, wood splinters or shavings, paint chips, etc. If such objects are found, they should also be removed for further examination.

The examination should attempt to determine the nature of the object responsible for the trace. Often such information shall be of cardinal importance in establishing the chain of events in the given crime. It is recommended that a specialist be consulted in such instances.

General Rules for Recording Traces. Traces uncovered at the scene of a crime must be recorded. Without this, it is impossible to guarantee their further use in the investigation of a crime and in determining the true nature of events.

The term recording refers not only to a written description of the traces included in a report, but also to the application of technical devices and methods intended to assure that the traces be preserved intact. In such a way, the traces may then be of further use as real evidence. The technique of such preservation includes either removing the trace itself, or making various copies of it.

The investigative report contains a description of all traces uncovered at the scene, an indication as to where they were discovered, their quantity, condition and general features (substance, form, size, colour, etc.). If a single object is found to contain several traces, indication is given as to the distance which separates them, and their interrelationship.

It is wise, in all cases, to photograph traces. The resulting photographs should show the location of the trace and its general appearance. Often a diagram is constructed, showing the locations of traces. Such a diagram should indicate the objects on which traces were found, their placement, relative to each other, as well as their individual shape and size.

The investigative report should also indicate the methods used for recording, removing and preserving the traces.

The following is an example of a description of traces as contained in an investigative report:

"On the left lacquered door of a double-door wardrobe, to the right of the keyhole, a barely visible fingerprint was found. The print is located 2 cm horizontally from the keyhole, has an elliptical chape and is 2.3 × 1.5 cm. The print precisely shows the whorls in a circular shape.

"The print was photographed using the method of photography to scale, then dusted with aluminium powder and photographed again. The print was lifted using a sheet of light-coloured pressure sensitive film. The film was stitched along the edges and a tag was attached which read: 'Fingerprint found in an apartment, the scene of a purported robbery'."

General Rules of Removing Traces. After examination, photographing and description, the traces should be removed and filed.

When choosing a method for removing the trace, the nature of the surface of the receptor should be considered first and foremost. If, during storage, the trace may be altered to such a degree as to make its further use as material evidence impossible (for example, a pat of butter, upon which a fingerprint has been found, may melt), it is imperative that a copy of the trace be made immediately, once all measures have been taken to preserve the object containing the trace.

The following rules should govern all work with traces: (a) attempts should be made to remove a trace together with the object on which it is located; (b) if the trace is located on an inexpensive (relatively valueless) and cumbersome object, a piece of which may be removed without significant damage to the whole, then that piece should be removed; (c) in the event that it is impossible to remove either the object or a part thereof, together with the trace, the latter is then copied using one of the methods described below.

4. Technological Devices and Methods of Recording and Removing Traces

Modern technological devices of recording traces may be divided into four basic groups: photography, securing the trace on the receptor's surface, making a cast of volumetric traces and removing superficial prints.

Before recording and removal, the trace must be prepared. All foreign matter should be removed from a volumetric trace (pebbles, sticks, leaves which have fallen in after the impression was made) and water should be removed either by using a rubber pipette or absorbent paper.

Since photography, as a method of recording traces, excludes the possibility of altering them, it is wise to apply this method first.

Traces are photographed using the method of photography to scale.

Securing Traces on the Receiving Surface. Often traces are found on substances whose surfaces are extremely unstable (sand, dust, flour, cement powder). It is therefore impossible to remove such traces without having initially secured them. In order to secure these traces, it is possible to use a solution of perchlorate and acetone which is absorbed into the substance. The solution, when dried, secures the segments of the given substance and the trace then is removed intact. In doing so, it is recommended that the trace first be sprayed (using an atomiser) with a 3-percent solution of perchlorate. One minute later a 6-percent solution should be induced, either by using the atomizer or an eyedropper. To speed up the hardening of the trace, the acetone is ignited with a match. The flame is allowed to burn for only 20-30 seconds (in order to avoid blackening from the flame). Another minute later, when the acetone from the deeper segments of the trace has risen to the surface, the process is repeated and again the flame is allowed to burn for only 20-30 seconds. This is done 3-4 times, as needed. In such a way, the trace will be ready for removal 10 minutes after the preparation process has been begun. The trace is dug out on all sides. A sheet of plywood or a metal plate is carefully slid under the trace and it is then transferred to another sheet of plywood with raised edges, on which a layer of wet plaster has been poured. After the plaster has dried, the trace is solidly fixed. Before sending the cast off for examination, a wooden lid is attached (either nailed on or tied on with twine). To completely fix a trace, about 100 ml of the 3-percent perchlorate solution and 300 ml of the 6-percent solution are needed.

Making Moulds of Volumetric Traces. If it is impossible to remove the actual trace from the scene, it is then imperative that a copy be made that gives the maximally precise representation of the shape, dimensions and features of the microstructure, in three dimensions. Various methods of making such copies are used, depending on the specific characteristics of different substances.

In investigative practice in recent years it has become popular to use a silicone paste (which has a number of merits) to make moulds of traces. Silicone paste is a viscous polymer mass which covers well and makes a good copy of the microrelief of traces left on various surfaces. If the paste is mixed with a so-called catalyst, it will quickly self-vulcanise and not contract. The mould is easily removed from the receiving surface.

The time required for polymerisation of the compound depends upon the temperature of the surrounding air and the quantity of catalyst added to the paste.[1]

The compound is prepared immediately before making a copy of the trace. The catalyst should be carefully mixed with the paste. The prepared compound is then poured into the cavity of the trace. It is then necessary to wait for the polymerisation of the compound which itself becomes a vulcanised, rubberised mass.

In order to make a cast from a trace which is on a vertical surface, a "pocket" of plasticene or paper is first made and attached to the trace before the compound is poured in.

In order to fill deep traces in dense materials with the compound, it is possible to use a large syringe.

Plaster casts are usually made from volumetric traces on soil. If the trace is on a free-flowing surface, then it must be secured beforehand so that it will not be damaged when being filled with the compound. The sides and base of the trace are secured by spraying them with a solution designed to form a solid crust.[2] Either sculptural or medicinal plaster may be used for the casts.

The technique of producing a plaster cast is as follows: a mixture is made of plaster and water in the proportions of 1 part water to 1.5 parts plaster. The plaster powder is sprinkled on to the water and thoroughly mixed in. Enough of the mixture is poured into the trace to cover the bottom. So as not to damage the trace, the mixture is poured in either through a funnel made of cardboard, or poured on to the edge of the trace where it will flow onto the bottom. Having poured in approximately 1 cm of the mixture, several chips (or pieces of wire) are laid on the surface. One of these is attached to a piece of twine with a label for the description of the trace. The rest of the mixture is then poured in to the trace. The cast will be set in 15-20 minutes and may then be removed. The chips or bits of wire inserted serve as reinforcement strengthening the cast.

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[1] At a temperature of +20° Centigrade, and if 8 parts of catalyst have been added, polymerisation takes place in about 10 minutes; 6 parts: 15 minutes; 4 parts: 35 minutes. Polymerisation will occur in 25-30 minutes if any of the following combinations are present: +25° C and 4 parts catalyst; +15° C and 8 parts catalyst; +25° C and 16 parts catalyst.

[2] Besides the aforementioned solution of perchlorate and acetone, the following may also be used to secure traces: mixtures of shellac in alcohol, sugar in water, rosin in acetone and others.

When removing the cast, it will be noted that sand will often stick to the plaster. This must be removed in such a way so as not to damage the cast. While on the scene, only those chunks of dirt should be removed which are not firmly attached to the cast. A final cleaning should be done by an expert.

Plasticene may be used to produce moulds of volumetric traces on rigid surfaces. Insofar as plasticene sticks to many surfaces and is deformed when removed, it is important to place a very thin layer (of a substance which will not prevent an impression from being made) between the plasticene and the surface. Such a layer may be composed of a powder (talcum or graphite) or petroleum jelly, which is spread over the trace prior to the preparation of the mould.

Before making the mould, the plasticene is kneaded by hand. It is then pressed into the trace and then removed. The resulting mould should be packed in such a way so that the impression should not touch the packing material.

Making Impressions of Superficial Traces. Using specially prepared sheets (2430 or 3040 cm) of photographic paper, it is possible to make impressions of superficial traces which may not be removed together with the object on which they are located (for example, a trace left by a dirty shoe on a wood or linoleum floor). For such impressions, either black or white photographic paper is needed.

To make black paper, the photographic paper is exposed, developed and irrigated; white paper is fixed and irrigated.

The technique of using photographic paper consists of the following: well-dried photopaper is covered (on the gelatinized side) with a 6-8-percent solution of perchlorate in acetone, to which has been added 4—5 percent of dibutyl phthalate. Photopaper which has been covered with the solution remains sticky for a prolonged period. When used to make copies of superficial traces, the paper retains particles of dirt, dust or similar trace-producing substances. White photopaper is used to make copies of traces made by dark-coloured substances, and black for light-coloured ones.

The actual technique of copying is as follows: the sticky layer of paper is pressed onto the trace, rolled out over its entire surface and then peeled off. The paper must not be repositioned once it has been placed in order to avoid spoiling the trace or its impression.

Sheets of rubber 3-4 mm thick may also be used to copy superficial traces. The surface of the rubber is prepared by rubbing it with emery paper. As a result of this action the surface obtains a nap (or pile) to which particles of the substance which constitutes the trace may stick.

5. Handprints

Handprints are, among various traces, the most reliable for use in investigating crimes. Their value lies in the specific qualities of the skin on the palm.

The skin on the palm contains numerous delicate linear rises which reproduce the contours of the lower layers, the dermis.

Skin is composed of two basic layers: the upper or epidermis, and the lower, or dermis (the actual skin). The dermis in the upper layer is composed of dermal papillae whose midsection contains ducts for sweat glands.

The linear rises of the epidermis, in their structure and placement, correspond to the papillae in the dermis. Hollows (or furrows) are located between these rises, and the alternation of rises and hollows give the skin on the surface of the palms a raised character (relief). The entire palm is covered in this manner. On smaller segments, the papillae are straight, but on the majority of the surface, they are curved. These lines never intersect, but they may come together, break off, split apart or make various complex combinations which are called papillary designs.

As the subject of criminalistic study, these papillary designs are characterised by three qualities: their individuality, relative stability and renewability.

Papillary lines are formed during the fetal period and are destroyed only after death, during decomposition. These lines do not change their placement (relative to each other) at all during an individual's lifetime.

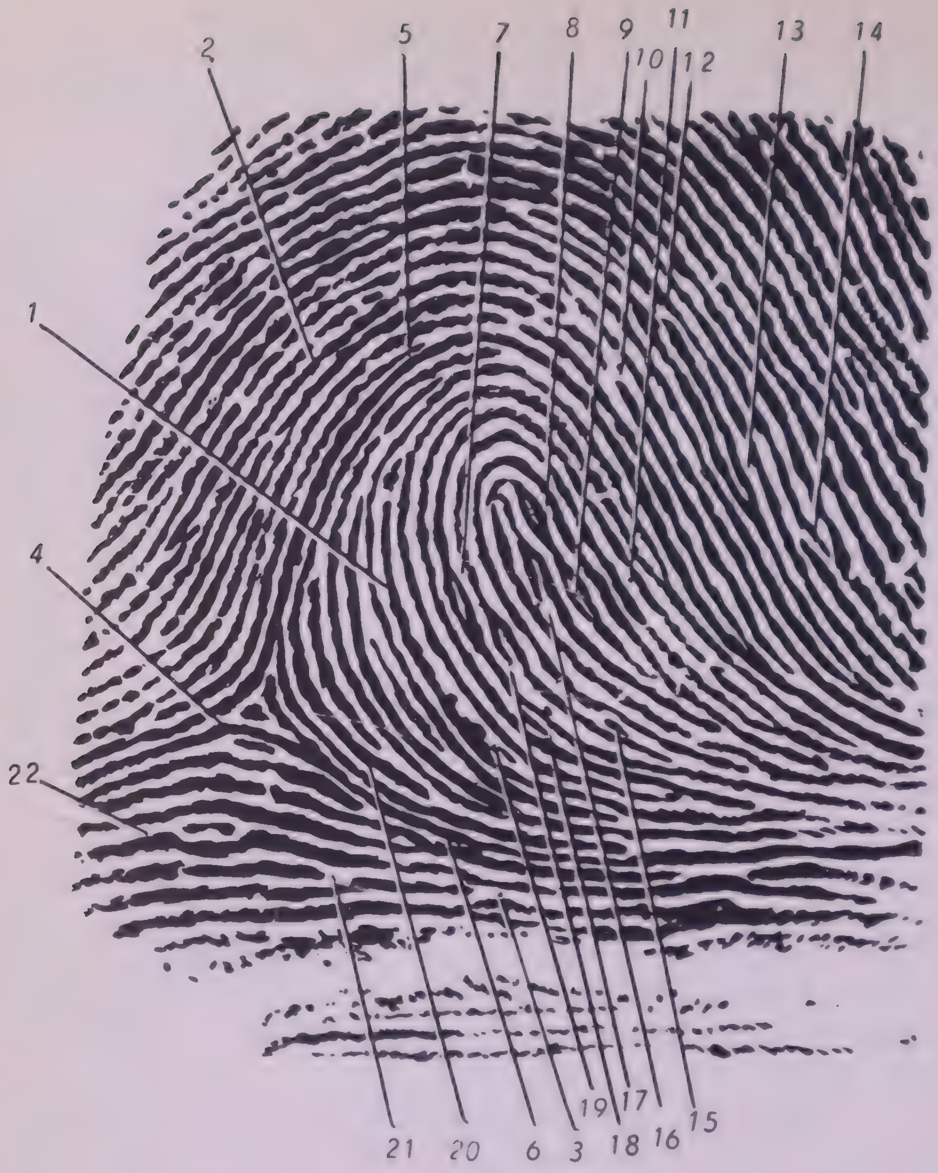

Fig. 11. Imprint of papillary pattern (superficial trace). Pointers indicate:

1. inner pattern; 2. line of outer zone; 3. base lines; 4. delta; 5. delta upper branch; 6. delta lower branch. Digits 7-22 denote the specific features of papillary patterns; 7, 8 and 9 — mesh; 10, 12 and 14 — beginning of the papillary line; 11. bridge; 13. convergence of lines; 15. point; 16 and 18 — whorls; 17 and 22 — line fragments; 19. dots; 20. bifurcations; 21. line endings

The *stability* of the papillary design is of great importance from the point of view of criminalistics.

The *renewability* of the papillary design refers to its capability of renewal after damage to the skin (a cut, burn, etc.) as long as the damage does not affect the lower layer of the dermis.

The *individuality* of the papillary design refers to the non-repeatability of the totality of its characteristic features. These features are divided into the following groups: a) general, which refer to the appearance of the design (arched, looped, whorled), its variations (normal or pyramidal loops, etc.) and dimensions; and b) individual, that is, those various peculiarities in the structure of the papillary lines which are expressed in the forms of hooks, forks, slivers, etc.

Identification of an individual may be made on the basis of a small portion of the palm, but more often it is done using the print from the terminal joint of the finger (fingerprints).

The papillary design of the fingertips has been carefully studied and classified. Classification is used in registering criminals, as well as when fingerprinting (dactyloscopic examination) is conducted.

Other portions of the fingers and palms do not contain such precisely classifiable designs. The papillary lines on the middle and base joints of the fingers are less curved. Certain areas of the palm contain papillary lines in the shape of triangles, while others have elliptical designs and similar arched, looped and whorled designs. All the same, a detailed classification of these designs does not exist. In spite of this, the papillary designs on the palm are successfully used in some instances of identification as they do possess a significant number of features.

As additional information in identifying an individual, it is also possible to use representations of the (sweat) pores and the so-called flexor folds as well as the "white lines".

The flexor folds are those folds of skin which are located on the surface, in those places where the palm bends. White lines are wrinkles on the surface of the skin.

Types of Handprints, their Discovery, Recording and Removal. Those handprints which are suitable for identification purposes are usually found on objects whose surface structures are finer than the papillary lines themselves. Such objects are those with smooth surfaces (such as glass, lacquered furniture, objects made of china, plastic, metal, etc.), as well as elastic, fine-grained substances such as plasticene or sealing-wax which has not yet set. On the latter, the traces left are volumetric.

Static superficial handprints give the best chances of identification as they usually give a precise representation of the papillary designs. These prints may be of an *ex-foliative* as well as a *layered* type. The latter includes *visible, barely visible* and *invisible* traces.

Visible handprints are usually produced by a foreign substance (such as ink, paint or dirt) which is detached from the palm or fingers.

Barely visible prints occur when sweat from the palm or fingers is rubbed off on a surface. Sweat is colourless, and does not contrast with the receiving surface. Such prints are usually found on objects with smooth, hard and non-porous surfaces.

Invisible prints are also sweat-based, but occur on surfaces which absorb them. Such prints are usually left on paper, card-board or veneer.

Ex-foliative traces are found infrequently. They are formed when the palm or fingers come into contact with a dusty or freshly-painted object. The result is that a portion of the surface adheres to the papillary lines and is carried away.

The method used to reveal handprints depends on the particulars of their production. When examining an object, the investigator should take care not to leave his own handprints, as these may later be confused with those of the criminal. Objects should be handled using only those surfaces which do not contain prints suitable for identification. For example, a piece of glass should be handled by the edges; a drinking glass or bottle should be lifted by the base or by the upper edge. In all instances, it is a good idea to handle the objects while wearing rubber gloves. When searching for traces, it is wise to use a magnifying glass with a large resolution. When examining for volumetric traces, it is helpful to use a light source from an oblique angle in order to better highlight relief features.

It is difficult to uncover barely visible sweat and oily handprints. Any object which may be suspected of containing such traces is first examined under various angles of light. It is advised that the location of such an examination be slightly darkened. The light source is positioned opposite the investigator and is angled so that any details are most noticeable. A flashlight lamp may be used as a light source.

Sweat and oily handprints, both barely visible and invisible, are revealed when *dusted with various powders*, provided that the surface is neither damp nor oily. This is due to the fact that sweat does not dry completely for an extended period of time and therefore particles of the powder will adhere to the print. The powder should be fine and dry. Traces on a dark surface are dusted with a light-coloured powder, while those on a light surface are dusted with dark powder.

Light-coloured powders may be made of any of the following: aluminium, bronze, zinc oxide, white lead. Dark powders contain any of the following: iron, graphite, soot or copper oxide.

Technique for dusting: a small quantity of the powder is picked up with a grainer brush [1] and then sprinkled on to the surface to be dusted. Having done this, the brush is then drawn lightly across the surface, spreading the powder evenly. The powder will adhere to those surfaces with the sweat or oily prints and then the remainder may be brushed off the clean surfaces.

Sweat and oily prints on paper are exposed by *dusting the powder across the surface* of the paper and then spreading it evenly by either tapping lightly on the opposite side, or by lifting up the edges. Excess powder is shaken off.

Recently, a very reliable method of dusting, using the so-called magnetic brush, has become quite popular and widely used. The brush may be used to expose prints on various surfaces.

The basic component of this method is a pivoting permanent magnet, to one end of which iron powder is always drawn, giving it the appearance of a brush. Using this tool, the surface containing the trace is treated. Only those particles of the iron powder which have adhered to the surface of the print remain [2].

Yet another widely used method of dusting is to *dust with iodine steam*. Fumigating a trace (which has been dusted with iron powder) allows it to be sticked to the surface upon which it is located.

Chemical means of exposing sweat and oily prints are based on a reaction of the salts in those organic acids (which are contained in the trace) with the solution used for exposure (ninhydrin or silver nitrate). Such means are used to expose traces on crudely structured surfaces (cardboard, veneer, etc.).

If it is impossible to remove a handprint together with an object, a copy is then made of the print. Several methods exist for making such copies. The most widely used of these is copying a trace after it has been dusted, or copying an ex-foliative trace on a dusty surface using dactyloscopic film [1] which consists of two celluloid layers. One of these layers is covered with a sticky substance suitable for copying, while the other is completely clean and serves as a sort of protection. Transparent film is used when removing traces dusted with dark powder and dark film is used for light-coloured powders.

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[1] The grainer brush may be replaced by a brush of soft fowl feathers.

[2] There are three kinds of iron powder: coarse, medium-grain and iron dust. The choice of which to use is made on the basis of the specifics of the trace and the surface on which it is located. For example, on a clean, smooth surface it is best to use the iron dust, while a rough or slightly oily surface needs a coarse powder.

Technique for copying prints on to film: from a sheet of special film (designed to copy traces) a piece is cut which is slightly larger than the trace itself. The protective layer is then separated from the base. The latter is laid, sticky side down, on the trace and smoothed out to cover the dusted surface. It is important to lay the film in such a way so as to prevent the formation of air bubbles and to avoid moving the film once it has been placed. The film is then peeled off the surface and covered with a protective layer. The two layers are pressed firmly together and sewn together along the edges. A label is attached to the thread used to bind the edges. This label contains descriptive information corresponding to the trace (where the trace was uncovered, how it was treated, etc.).

The film containing the fingerprint should be immediately photographed in the event that the print be destroyed, or that the film itself be damaged.

Any trace dusted with powder, even iron, may be copied using the silicone compound. In order to do this, the treated print is covered with the compound and then a sheet of smooth plexiglass is pressed down on top. This method makes it possible to copy various traces with differing surfaces: concave, convex or ribbed.

To remove traces treated with iodine steam, a sheet of paper, *saturated beforehand with a solution of ninhydrin* is used. A sheet of irrigated, fixed and dried glossy photo-paper is soaked for a few hours in a 0.2-percent solution of ninhydrin in distilled water and then dried. Before copying the trace, the paper is dampened and then applied to the trace. The imprint will be either dark-blue or blue-violet.

Moulds of volumetric traces are done according to the methods already described.

Dactyloscopic expertise should be consulted in order to establish the identity of the individual responsible for a given print. It is important, then, to send these experts for identification and photographing the object containing the print, as well as all fingerprints of each suspect or other individuals who might have accidentally or inadvertently left fingerprints at the scene.

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[1] When necessary, such film may be replaced by either white or black photopaper which has already been fixed and is slightly damp.

6. Footprints

Ttraceology is also often concerned with the study of footprints.

Practice often deals with footprints from footwear and only rarely with prints made by bare feet. These prints may be static and dynamic, volumetric and superficial.

Volumetric static prints made by footwear contain the most information for identification purposes. They are usually formed in soft earth. In studying such traces it is possible to determine not only the shape and size of the footwear which made the prints, but even to identify the actual shoe.

Footprints are usually produced while walking or running. In either action, the heel is first lowered on to the supporting surface accompanied by pressure applied forward and downward. This is followed by contact made by the intermediate segment, then the sole, and finally the toe, during which pressure is directed backward and downward.

The lengthwise profile of a volumetric shoeprint or print made by a bare foot on soft earth resembles an arch with depressions in the heel and toe areas. Therefore, the exact length of a trace on soft earth is determined using the length of this arch.

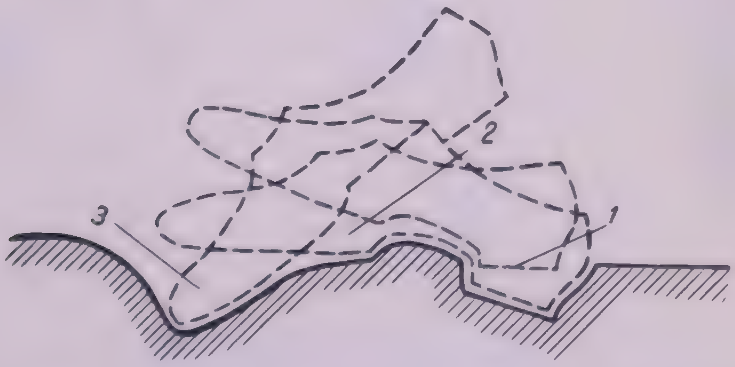


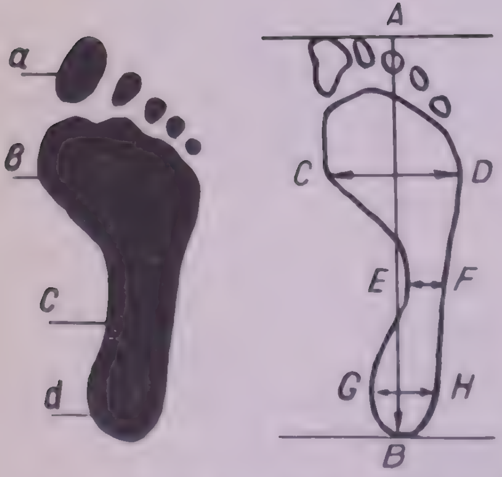
Fig. 12. The way in which a static volumetric shoeprint is formed (contour shows the three positions of the shoe in walking):

1. lowering the heel; 2. rocking; 3. pushing off with shoe toe

Superficial shoeprints are usually produced by footwear with dirty soles on even surfaces such as parquet or linoleum floors, pieces of paper and the like. The value of such traces for identification purposes is not very great. These traces may serve only to establish the shape and size of the footwear and only in rare instances will actual identification be possible.

A superficial print which may be suitable for examination may also be made by the bare sole of the foot. Such a trace is usually produced by sweat mixed with dirt or dust. The skin on the sole has, as does that of the palm, papillary designs which have those same characteristics, but the pattern on the foot is greatly simplified.

It is possible to identify individuals on the basis of their footprints and the papillary designs on the sole. To do this the segment of the sole which is represented in the trace is



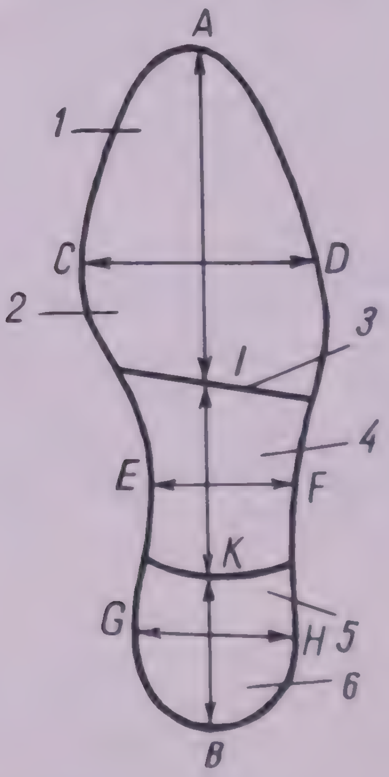


Fig. 13. Parts of human foot, and measuring a bare foot trace:

a — big toe; b — metatarsal section; c — intermediate part; d — calcanean part; AB — length of footprint; CD — width of metatarsal section (widest part); EF — width of intermediate part (narrowest section); GH — width of calcanean part

Fig. 14. Sole parts and measurement of footprint:

1. toe; 2. sole; 3. sole hind edge; 4. intermediate part; 5. heel front edge; 6. heel; AB — length of footprint; AI — length of sole print; CD — width of soleprint; EF — width of intermediate print; IK — length of intermediate print; KB — length of heelprint; GH — width of heelprint

identified. Those characteristics which the given segments show are then compared.

It is rare that a crime scene will yield *dynamic shoeprints* which will be suitable for examination. These are formed by metallic objects (such as brads, nails or taps) on the sole of the shoe and may be used in identification.

Traces under examination are usually easily visible. Exceptions to this rule may be various individual prints and sweat traces left by bare feet.

Invisible traces may be left on linoleum, painted or lacquered floors, paper, marble, tile or glass by footwear with rubber or synthetic rubber soles. These traces are treated with iron powder and then transferred to a specially treated paper which has a sticky surface.

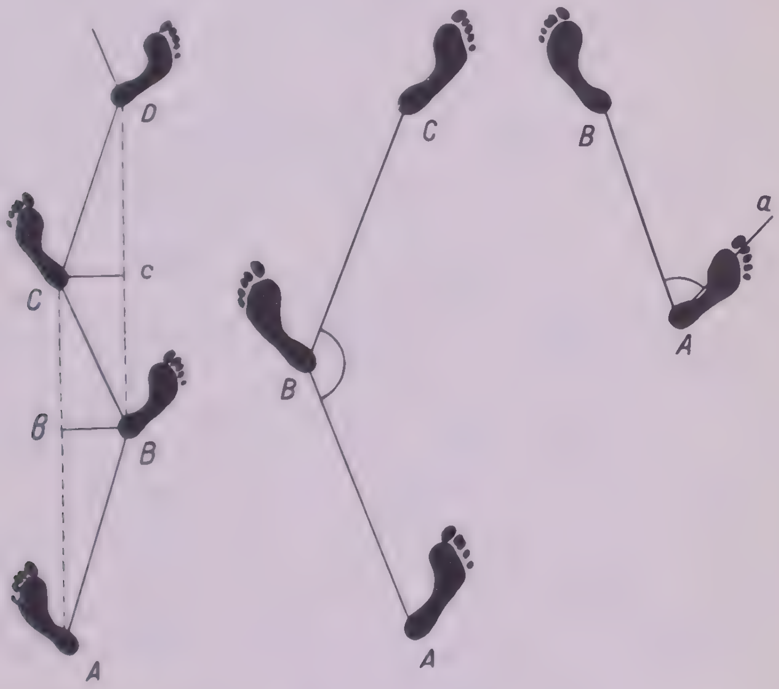


Fig. 15. Footprint track:

A, B, C, D — walking line; AB, BC — length of step (right and left); Bb, Cc — width of step (right and left); ABC — angle of step; Aa — foot line, BAa — foot angle

Barely visible sweat traces are uncovered by using light sources from various angles during investigation. These are treated with a solution of ninhydrine and coarse-grained iron powder.

When a shoeprint or bare footprints are uncovered, they are measured and described in the investigative report. It is important that identification of the segments of the trace correspond to the names of the parts of the foot and sole of the shoe.

When measuring shoeprints, the overall length of the sole, of the heel and intermediate segments, and of the heel itself are determined according to a line which runs through the outermost points of the curve of the heel and toe. The width of the heel segment is measured at its widest point, while that of the intermediate segment at its narrowest point. The width of the heel is measured at its widest point or along the forward edge.

In a volumetric shoeprint the overall length and lengths of separate segments are measured along the slanted profile line of the base of the trace.

When measuring a bare footprint, the overall length is initially determined along a line which runs through the outermost points along the curve of the heel and through the centre of the base of the third toe, to the point where the lengthwise line intersects with a perpendicular originating at the outermost forward edge of the big toe. Then the metatarsal, intermediate and heel segments are measured along the same lines as are used to measure shoeprints. Finally the length and width of the toes are determined.

If a series of footprints are found at the scene of a crime, its component elements should be determined and described in the investigative report: the line of walking, the length and width of the steps, their angle of turning, the direction of the foot and its angle of turning (see Fig. 15).

Individual shoeprints and paths of tracks should be photographed. The components of the path should be indicated in the diagram. Casts are made of volumetric prints while superficial prints are copied on to paper having a sticky surface.

Studying footprints yields information which aids in determining the circumstances of a given case. For example, shoe size may be determined by examining footprints. Even the look and fashion of footwear may be determined by studying the configuration of the marks left by the sole, as well as the details of pattern, the shape and size of the heel and other features.

The height of an individual may be approximated with the help of footprints, using the formula that height is from six to seven times the length of the foot.

Studying an individual's gait will give certain information about him. For example, a left-handed person's left step is longer than his right. The length and angle of the step of a person with a limp will be shorter on the lame leg than on the healthy one.

Footprints and shoeprints, or their moulds or prints should be submitted for expert examination together with the footwear or prints of bare feet of the suspect.

7. Traces Left by Tools Used in Forcible Entry and Other Instruments

Various instruments and tools may be modified as specialised burglary devices in order to allow a criminal to overcome obstacles preventing him from entering a given premises. Examples of such instruments are simple metalworking, carpentry and joiners' tools such as chisels, hammers, axes, hacksaws, pliers, wire-cutters, etc. Often a criminal will use a chance object such as an iron bar or a section of pipe or a rock as a tool for breaking and entering. If the obstacle is one made of iron, the criminal may make use of welding and other torches which will burn through safe doors, iron boxes and other objects.

It is important for the investigator to be familiar with the typical means of breaking and entering. On the basis of this information, it is possible to determine the nature of the events under investigation. For example, it is possible: to differentiate the actual breaking from a false one; to determine the type of the instrument used in the forcible entry; and to speculate on the physical strength and capabilities of the individual who committed the forcible entry. A careful study and cataloguing of the means of breaking and entering will aid in capturing or revealing recidivists, in conducting preventative work of organising protection of objects, and in the construction of locks and the development of burglar alarms.

Objects of forcible entry may be divided into two basic groups: a) locks and b) construction barriers and storehouses. The means of overcoming one or another of these obstacles are significantly different.

Locks are divided into padlocks (external) and dead-locks, (internal, inset). The criminal either forces the lock or breaks it open.

Locks may be forced by using similar keys or a copy of the original, a lock pick, pass-key, special lock-picking tools, pliers, pipes or by pressing back the lock-bar with a chisel or crowbar.

When unlocking with a similar key or a copy, key arched traces are left on the back wall of the key box, whose radii do not exactly correspond to those of the original, actual key. It is often possible to uncover traces from burrs on the copy key on the lock-bar and ward.

Various parts of a lock may be broken off during such an operation and will remain in the lock box. It is also possible to even find parts of the key which have been broken off (usually the grooves). If the missing part of the key is found on the suspect, it is possible to complete the identification by matching the two halves.

Jemmies are special devices for opening specific kinds of locks. These instruments may be either complex, or fairly simple, such as a hooked piece of wire.

Scratches from jemmies are left on the inner walls of the lock box, the ward, and on the side surfaces of the keyhole. Separate segments of the lock may be broken off.

Tweezers with long thin blades and seration may also be used to grip and turn a key left in a dead-lock. When such a device is used, it leaves scratches on the top of the key.

The *lock-bar* may be pushed back by inserting a thin metallic object with a sharp tip into the crack between the door and the lock box. The tip of the metal object is then used to press the lock-bar back into the box.

This operation leaves scratches (from the sharp end of the thin metallic object) on the lock-bar and pressure and friction marks on the door.

Padlocks are broken open by pulling out, or cutting (using a special pair of scissors) or sawing through the lock handle, or by breaking open the lock box.

When pulling out the lock handle, the instrument used as a lever will leave scratches on the surface of the door, box or other object. Scratches may also be found on the lock box itself.

Special scissors used to cut out the handle leave unique traces on both sides of the object. These traces may then be used in identifying the tool itself. Sawing is done using, most frequently, a metal hack-saw, and less frequently, a three-edged file. This type of operation produces traces which are not suitable for identifying the tool. They can only be used to speculate as to the overall appearance of the tool used.

However, this operation produces traces in the form of filings. The absence of such filings, or a small amount of the same is witness to the fact that the sawing was done either entirely or partly in a different location. This may give reason to suspect that the crime was staged. It is, of course, imperative in any case, to determine whether or not the filings have been swept up.

Such filings may be discovered on the footwear, clothing or under the nails of a given suspect. Similarities between the filings found on the scene and those uncovered on the suspect may serve as valuable evidence.

Those devices used to hinge a lock (rings, clamps, loops or brackets) may be forced by either extraction, cutting or sawing through. Each of these operations leaves corresponding marks on the object.

Not only are locks often the objects of breaking and entering, but also windows, doors, walls, ceilings, floors and even iron and wooden cabinets, crates and trunks.

Two types of methods are used to break open such objects: either pressing back or destruction.

Pressing back is used to open doors, windows, drawers, cabinets, trunks, etc. The same kind of pressure is used in these instances as is used in pressing open a lock. First the instrument of burglary is inserted into the opening between the hinges and then it is used as a lever to widen the opening. Those marks left by the insertion of the instrument resemble a straight line and have the characteristics of the surface features of the corresponding sides of the instrument. Such marks are of little value in determining the shape and size of the instrument, but, in principle, identification may be made.

The use of the instrument of burglary as a lever leaves pressure marks on various parts of the lock: on one side of the opening marks from the tip of the pick, and on the other, marks from that segment which served as a base for the lever. By using these marks, expressly those made by the tip of the instrument, it is possible to determine its shape and size (or at least its tip) and sometimes even the group of objects to which it belongs. It may also be possible to determine its individual identity.

Criminals will simply *destroy objects which hinder* their entry in those instances where they do not fear to draw attention to themselves and their actions by the resulting noise. The destruction may be entire or partial.

The given method possesses several variants. One of these is the *removal of segments of the obstacle together with an internal lock*. One or several holes are first drilled into the object and into one of these a saw is inserted. A portion of the obstacle is then sawn away together with the lock. The traces left by the drilling and sawing will often only yield information as to the appearance of the instrument used. Another variation on this method is *to drill, saw or cut an opening in the object large enough to allow a hand, or a tool, to pass through in order to then open a lock or bolt*. The opening is made using the same method as is used to remove a portion of the object.

To destroy an obstacle at its weakest point, for example a door, a panel is either cut or broken out. In walls, ceilings and floors a poorly fixed board or plank may be cut or torn out. A loose brick is initially removed from a brick wall and then, using a chisel or crowbar, the rest of the masonry is broken up to make an opening.

Glass surfaces are either *cut* (using a diamond or glass-cutting tool) or *broken out* of their frames (windows). In order to cut down the noise from the falling glass, the criminal often makes use of a so-called band-aid. A piece of cloth is treated with a sticky substance and then stuck to the glass to prevent the fragments from scattering.

Traces from instruments used in a forcible entry are examined and recorded according to the general rules as described in this chapter. All traces should be described in detail in the investigative report. Examination and recording should not be confined only to those traces discovered in the immediate vicinity of the forced entry. It is imperative to examine and record those traces when an entry was attempted, but proved unsuccessful. The condition of the lock and the traces left by the forcible entry should be photographed to scale. Broken locks, portions of doors, windows and other objects which contain traces, should be removed in their entirety and only in extreme circumstances should moulds be made. It is imperative to remove all real evidence from the scene of the crime (chips, glass slivers, shavings and filings, etc.).

The following objects should be submitted for expert examination to determine the method used to break in, the general features of the instrument used and, if possible, its actual identification: (a) locks: the lock (in the condition in which it was found on the scene), the instrument suggested as a possible tool for breaking and opening the lock (for example, a key, lockpick, scissors or parts thereof); (b) broken barriers: the portion of the barrier with the traces or a cast of the same, together with the suggested instrument of destruction.

In addition, any photographs or diagrams of the placement of traces should also be submitted for expert examination.

8. Vehicular Tracks

Vehicular tracks are those representations of separate sections of any vehicle which can be concretely recorded. These make it possible to explain the course of events in a given case as they have relevance for the vehicle and for the manner in which it was used.

Investigative practice deals mainly with wheeled forms of transport and rarely with vehicles on (caterpillar) tracks.

Tracks left by wheeled vehicles belong to those tracks produced by rolling due to the mechanism of their formation. Depending on the characteristics of the receiving surface (a dirt road, or one with a man-made surface), these tracks may be either volumetric or superficial. The former are the result of a deformation of the soft earth, and the surface then shows a relief of the wheel's surface. The latter are actually tracks made by a dampened or soiled wheel surface.

The braking of the vehicle's wheels produces dynamic traces.

Such vehicular tracks are studied in order to determine the group to which the given vehicle belongs, as well as to determine its actual identity. This study may also yield information as to the manner in which the vehicle was used: the direction of its movement, the places where it stopped, braking, etc.

Most often criminal investigation is interested in examining tracks made by automobiles, motorcycles and motor scooters (mopeds). These vehicles use pneumatic tires which have raised patterned surfaces that are reflected in their tracks. The vehicles are characterised by the quantity of axles and the number of wheels per axle.[1]

The mechanics of producing vehicular tracks has its own particulars. The number and location of the resulting tracks usually do not correspond to the number of axles and wheels. This is explained by the fact that, in motion in a straight line, the track left by the front wheel (or wheels) is usually completely obliterated by that of the rear wheel (or wheels). An exception to this is the so-called freight motor scooter whose front and rear wheels are not positioned one behind the other.

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[1] Various types of automotive transport vehicles usually have two axles (front and rear), each having either one wheel (motorcycles and motor scooters or two (passenger automobiles). Other possible combinations are as follows: one wheel on the front axle and 2 on the rear (freight motor scooters); 2 on the front axle and 4 on the rear (passenger buses and freight automobiles). Some cars have 3 axles, the front having 2 wheels and remaining 2 axles with 4 each.

The tracks of the front and rear wheels of biaxial vehicles may be distinguished only on turns where they do not coincide. During a turn, six-wheel motor vehicles produce tracks only for the front and rear wheels; the tracks made by the intermediate wheels are covered by those made by the rear wheels.

It is possible to determine the appearance, make and model of automobiles and similar vehicles by studying the tracks made by the pneumatic tires. The data concerning the pattern shown in the tire tracks is compared to similar data in special tables of information relating to the running gear of such vehicles.

The width of the rut gives information as to the distance between the wheels on a single axle. On certain makes this distance is standard and constant.

The width between the front and rear wheels is also distinguished. It is determined by measuring the distance between the centre points of the tracks of single wheels, between the midpoints of the tracks made by double wheels, or between the impressions made by comparable segments of the treads on the left and right tires.

The model of the tires is also determined by studying tread marks and tracks. Certain types of pneumatic tires are designated for use with certain makes and models of cars. The tires are characterised by their exterior and interior diameters, their width, the height of their profile and the tread width and pattern.

The exterior diameter of the tire is determined approximately by the length of the circumference of the wheel, which roughly corresponds to the length of the track made by one full turn of the wheel. This is determined by measuring the distance between two consecutive impressions of one of the patterns of the tread.

The measurement of the wheel circumference will change slightly due to the weight of the cargo, the pressure on the tire, the composition and condition of the ground, as well as to the speed of movement.

The width of the tread mark, under normal circumstances (tread not extremely worn, normal inflation, etc.), corresponds to the tracking surface of the tire.

Often different makes of tires will each have their own tread pattern. Some models use the same pattern which is, however, differentiated by size.

The results of measurements and examination of tread marks are compared to the data in available tables and conclusions are made as to the model of tire responsible for the tracks.

Further, conclusions as to the make and model of the vehicle which made the tracks are formed on the basis of the identified tires, the width of the rut between the front and rear axles and the number of wheels present. Again, available tables are used.

The construction of *carts* may be determined *by studying their wheel tracks.* In order to do this, it is necessary to identify the type of tires (pneumatic, solid rubber or iron), the number of wheels, axles and their width, as well as the length of their circumference.

By studying the *traces left by caterpillar* which reflect the tracks and links in the wheel assembly, one may also determine the make and model of the vehicle. The marks usually precisely reflect the size, construction and finer details of the caterpillar tracks.

Animal Tracks. Horseshoe prints have the most practical value in investigative practice. They may be superficial (on an asphalt surface) and volumetric (on soft, fine-grained earth). The latter show not only the size and structure of the horseshoe but may also allow specific, individual identification, as the spikes, nail pattern and nail heads usually have a large number of characteristic features. Identification of the specific horse responsible for the prints is, for all practical purposes, almost impossible, due to the speed at which horseshoes are worn out and changed.

The general rules of discovery, examination and recording of any type of tracks are applicable to vehicular tracks as well. Tire tracks should be photographed in panorama style, to scale. Plaster casts are made of those separate segments which contain a maximum of detail. It is also wise to trace a diagram of the tracks with an indication of their dimensions. If tracks are found on paper or on the clothing of a victim, it is recommended that, after photographing, the object be removed, together with the traces.

In the case of traffic accidents, tracks may be left not only by the wheels, but by the bumper, radiator grille, any protruding segments of the body, wheel shafts and axles. These traces may be found on the body or clothing of an individual, on fences and posts, or on parts of other vehicles involved in the accident. It is difficult to determine the make and model of a car on the basis of these tracks, but sometimes it will be possible to identify the general group to which the detail which made the trace belongs. In some instances, it may also be possible to specifically identify the part.

The direction of movement, stopping places and places of braking are determined by the following characteristics:

When crossing puddles, ditches or mud, the substances splash in the direction of movement of the vehicle. This may be determined by studying the superficial traces (on the dry segments of the road) formed by the damp wheels after crossing the puddle. Should a wheel run over a slender stick, branch or blade of grass, these objects will break, forming an angle opening in the direction of movement. Drops of liquid (such as oil or gasoline) falling from a moving vehicle will leave spots or rays whose uneven edges are pointed in the direction of movement.

The location of places of braking is determined by examining the skid marks which are formed by a certain amount of movement of the vehicle after the brakes have been applied. These marks resemble a streak and the tread pattern is not discernible. When braking on dirt, a mound of dirt is formed at one end of the strip by the interaction of the tires with the earth. This mound indicates the direction of movement. The place where a car stood is determined, to a great degree of certainty, by traces of oil, water or fuel.

The following should be submitted for expert examination in order to identify the vehicle responsible for a given track: (a) copies of the tracks (plaster casts or scale photos); (b) diagrams showing the location of the tracks; and (c) the tires which could possibly have made the tracks. If it is impossible or difficult to send the latter, a copy of the tread should be sent in its place. This copy is made by using typographical ink and white paper. The length of such a copy should be $1^1/_2$ times that of the circumference of the tire.

9. Teeth and Nail Marks

Teeth marks are found on food objects (cheese, butter, chocolate, apples, etc.), as well as on the body of either a victim or an assailant. It is possible, on the basis of such marks, to speculate on the nature of the events, for example, a struggle between the victim and the assailant. Teeth marks may also lead to an individual's identification.

The external structures of teeth are unique and individual. Their shape and size, their interrelationship and characteristic features may be clearly indicated in teeth marks.

Investigative practice usually deals with marks made by front teeth, especially the upper ones. These marks are of two kinds: an upper bite which shows the cutting or chewing surfaces of the teeth, and a bite which shows the front surfaces of the teeth. The mark left by the former resembles a depression while the mark left by the latter looks like a row of consecutively placed lines (cylinders or grooves).

These traces are recorded according to the general rules, but keeping in mind the specifics of the receiving surface. The use of silicone paste enhances the possibilities of making copies of such marks. Teeth marks on a human body are recorded and removed by a forensic medical expert.

Not only should the teeth marks (or copies thereof) be submitted for expert examination, but casts of the suspect's teeth, as made by a dentist.

Nail marks are most often found on an individual's body, and their significance for identification is rather minimal. Insofar as nails do not have strikingly expressive details, and the human skin is elastic, such marks from nails do not usually contain clearly defined characteristics. All the same, the location of such marks, together with their number and character may give some indication as to the nature of the events under investigation, for example, the nature of a struggle between a victim and his assailant. Therefore, it is recommended that nail marks be carefully studied and photographed.

If pieces of skin from the victim, or any other foreign substances are found beneath the suspect's nails, these contents are removed and the nails clipped off. All of this is then submitted for expert examination.

10. The Fundamentals of the Expert Study of Traces

Questions whose answers are the domain of the expert study of traces may be divided into three basic groups: 1) determining the mechanism of producing a given trace; 2) determining the group of objects to which a given producer belongs; and 3) determining the identity of the producer on the basis of the traces.

Each method and technique of answering any of these questions has its own peculiarities.

Determining the mechanism of trace production, with the aim of explaining certain circumstances in a given case, may be an independent task for the expert. In addition, it often happens that determining the mechanism of trace production accompanies the solution of other questions.

This mechanism is determined on the basis of a study of the features of the contact between the receptor and the producer, their interrelationship (in terms of placement), their component substances, the interrelationship of the location of several traces, the presence and number of objects and substances which appear as a result of contact (chips, shavings, fragments, etc.).

In order to aid the expert in determining the mechanism of production, all materials of the case relevant to the treatment of traces (investigative reports of examination, photos, diagrams) should be submitted along with the object being investigated. This gives the expert the possibility of choosing the best method of examination which then allows him to more fully study the traces and correctly evaluate the results of investigation already performed.

The identification of the group of objects by their traces is often an independent task for the expert. Conclusions are made on the basis of its general characteristics as reflected in the trace. In order to solve this problem, informative tables are used.

The most important task of the examination of traces is to determine the identity of the object which made them. On the basis of this examination, a conclusion is made as to the nature of the object which left a certain trace. It is based on the results of a comparison of characteristics in the trace with those of the object (or mould of the same) which is suspected of leaving the trace.

If possible, the actual object should be submitted for expert examination. As a rule, moulds and photographs reflect only a portion of those features and characteristics which are important for identification. Only in exceptional cases when, for one or another reason, it is impossible to send the object itself for examination, a copy is made. The technique of copying differs and depends on the features of the object, the mechanism of producing the trace, the character of the substance upon which the trace was produced and several other conditions. It is recommended that experts be consulted in these instances.

Examination consists of two stages. In the first stage, the object which is the basis for identification (the trace on an object, or a mould or image of the same) and the object being identified (the object being verified or a mould or imprint of the same) are each submitted to different analyses, insofar as it is important to uncover and study the general and individual characteristics of the structure of the object represented in the trace and those of the object being verified. In order to examine these objects, magnifying instruments, photographic equipment and measuring instruments are used.

At this stage, experiments are conducted in order to obtain test traces which are as close as possible (in terms of their production) to the actual traces under examination. Such experiments yield information about the production of the traces which is important when studying dynamic traces, as the angle at which the producer meets the receptive surface significantly affects the way in which the traces reproduce specific features.

The second stage of examination is concerned with comparing the features found in the trace with those of the object being verified. The task at this stage is to identify coincidences and differences in these individual features, as well as in the features taken as a whole, and to explain any accidental coincidences or differences that may exist.

A comparison microscope is used at this stage. A montage is made from various microphotographs; coincidences and differences are studied by superimposing photos of the trace on those of the suspected producer (or on a model of the same).

The course of the examination should be described in detail in the expert's concluding report. Photographs showing those coincidences and differences which have been uncovered should be attached to the report.

Sometimes it is the task of the expert study of traces to identify a whole object from its parts. The necessity of such an identification occurs when separate parts of an object have been found and the questions arise as to whether or not they originally constituted a whole. The practical need for such examination occurs quite frequently; for example, when fragments of an automobile headlight are found at the scene of an accident and on a car which is suspected of being involved in the accident; when a fragment of a key is found in a lock and remainder of the actual key itself is found on the suspect; or when the tip of a knife is found in a wound, and the knife itself with its broken tip is found on the suspect.

This type of examination is conducted by placing the separate parts of the object, along the "break" lines, together. These lines of division on the object always have a significant number of separate characteristics which make the object unique. During investigation, several other types of features (in addition to traces) are used in comparing the two objects. For example, the characteristics of the substances of the two objects, texts on comparable pieces of paper.

Currently there exist methods of examination which permit the identification of a whole by its parts, even when there are no general lines of division. This problem is solved by revealing the particulars of the objects' internal structure which may be seen in a characteristic pattern.

Such methods include the X-ray examination of papier-mache objects; the examination of objects made of transparent, optical (activated) plastic under polarised light, and the examination of plastic objects using a radiointoscope.

CHAPTER IX

FORENSIC BALLISTICS

1. The Concept of Forensic Ballistics and Its Significance in Uncovering Crime

Forensic ballistics is a branch of criminalistics studying the methodology of investigating crimes committed with the use of firearms and munitions.

The means and techniques developed in forensic ballistics help to establish the circumstances of a crime by shot traces.

In developing the techniques and means for uncovering a crime, forensic ballistics relies on the principles of general ballistics, but also has its specific objectives.

Forensic ballistics is closely connected with other branches of criminalistics, particularly, traceology. The scientific principles of traceology are used to examine the regularities involved in the forming of traces on bullets and cartridge cases, and also to determine the totality of specific identification features.

Forensic ballistics is connected with forensic medicine, which studies gun injuries on the human body with account for the general principles of forensic ballistics. In practice, when the knowledge of both a forensic medical expert and a criminalist is needed to establish the position of the victim at the moment the shot was fired so that various relevant factors could be determined, a combined forensic ballistic and forensic medical expert examination is ordered.

2. Firearms and Ammunition as Objects of Forensic Ballistics Research

Modern hand firearms normally used to commit crimes comprise numerous parts (*Fig.* 16), which have varying impact on the forming of shot traces on bullets, cartridge cases and the objects of gunfire. The barrel, trigger and the firing pin have topmost significance for forensic ballistics, since they specify the nature of trace forming on bullets, cartridge cases and the object fired at.

The *barrel* represents a hollow cylinder, whose anterior end (the muzzle) is open, and the posterior end (the breech), with a slightly enlarged bore and barrel diameter, is closed. A cartridge placed in the breech is fired by pressing a trigger.

Depending on the barrel length, the firearm is classified into *long-barrelled* (rifles, carbines, hunting rifles), *medium-barrelled* (submachine guns), and *short-barrelled* (revolvers, pistols).

Hand firearms may have either rifled or smooth barrels.

Rifled firearms have helical grooves along the inside called riflings. As bullet moves up the barrel grooves make it spin which ensures distant and stable flight in a given direction. The number of grooves, their direction and the width of pitch

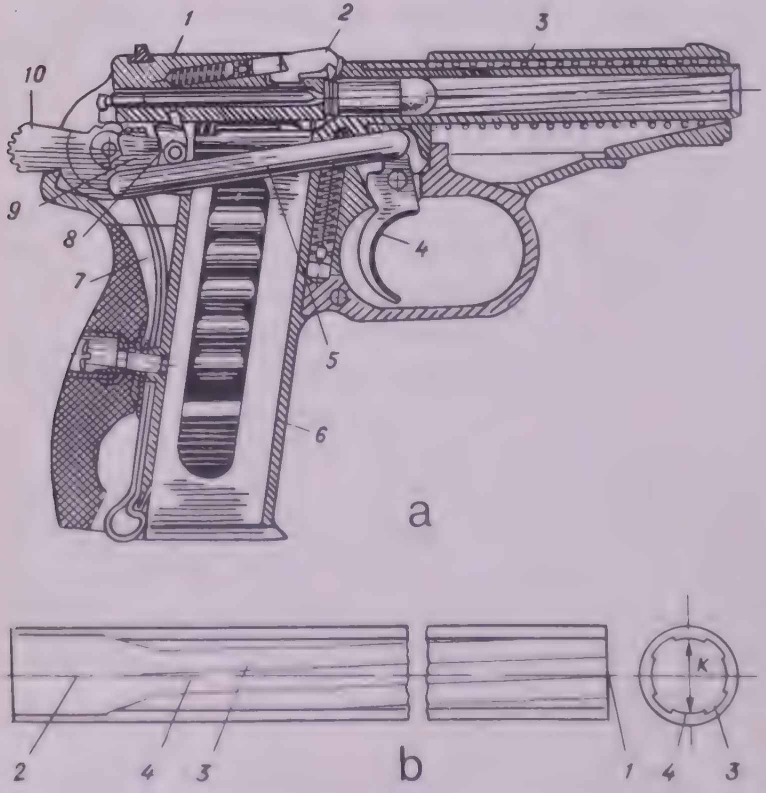

Fig. 16. a — pistol design, model "PM"

1. slide; 2. extractor; 3. recoil spring; 4. trigger; 5. trigger bar; 6. magazine; 7. mainspring; 8. trigger cam; 9. cocking lever; 10. hammer

b — barrel design:

1. bore face end; 2. chamber; 3. rifling; 4. land; c — calibre

(steepness), in specific firearms vary. Most systems are characterised by four or six riflings, though firearms with five, seven and eight grooves are also occasionally observed. Grooves may be both to the right and left, and the interval in-between are called *lands*.

The bore of smooth-barrelled guns has no grooves, and their shooting accuracy is ensured by a corresponding design of barrel. Depending on this, smooth barrels are classified as follows: with a uniform cylindrical bore (the same size from breech to muzzle); choke bore, a bore that gradually tapers towards the muzzle. There also exist full chokes and modified chokes.

The bore diameter is called the *calibre*. In rifled guns, this is the distance between opposite lands, mm. The most widespread systems have bore calibres 5.6, 6.35, 7.62, 7.65, 8.0 and 9.0 mm. The gauge of smooth-barrelled weapons originally indicated the number of spherical lead balls of bore diameter that weighed British pound. There are three gauge bores which are the most popular: —12, —16 and —20 gauge [1].

In the firing mechanism, the slide, extractor, and striker have special significance for forensic ballistic research. All of them touch the cartridge to leave traces on it. The slide propels the cartridge into the barrel, locks it from behind during the shot, and ejects the fired cartridge case from the chamber. The gun is equipped with an extractor and ejector to extract the fired cartridge case; these parts are often mounted in the slide, but are sometimes located separately. The striker with the firing pin serve to ignite the primer, and are normally installed in the slide and the firing pin outside the slide (for instance, in "break-open" shot-guns).

Depending on the action of the firing mechanism, weapons are classified into automatic and non-automatic firearms.

In automatic weapons, the energy of gunpowder gases is used both to eject the projectile and to recharge the weapon. In other words, under the impact of gunpowder gases, the slide moves back to eject the fired cartridge case, and then, under the impact of the spring, move forward to capture and ram the next cartridge into the chamber. In this case, the slide is set in cocked position. Weapons involving only this recharge cycle are called self-charging, and those in which this cycle can be continually repeated as long as the trigger is pressed are called automatic.

Non-automatic firearms are recharged manually.

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[1] Nowadays, the gauge of such weapons is shown also in millimetres.

Pistols, revolvers, small-calibre rifles, hunting guns, and home-made and remade firearms are used most frequently in investigation practice.

The *pistol* is a short-barrelled weapon in which ammunition is supplied from a magazine, usually installed in the grip.

The *revolver* is a short-barrelled non-automatic weapon, whose ammunition is supplied by a rotating drum with nests, wherein cartridges are installed manually. On cocking the trigger, the drum turns to stop the next chamber (nest) in front of the bore.

Rifles and carbines are long-barrelled service firearms. In carbines, the barrel is slightly shorter than that in rifles; but their firing mechanisms are structurally alike. Rifles and carbines are non-automatic weapons, and are reloaded manually by pulling the slide back and then driving it forward together with the cartridge captured from the chamber. The magazine holds five cartridges.

Small-calibre rifles are non-automatic long-barrelled weapons, calibre 5.6 mm. The bore normally has four grooves, sometimes six in other models. These firearms are supplied with a slide whose design resembles those found in rifles.

Smooth-barrelled shot-guns may be of two types: "break-open" and "non-break-open". The latter resemble rifle in design and have a moving slide. In "break-open" shot guns the firing mechanism is installed in a special part called the "block", to which the barrels are connected.

All "break-open" guns have a trigger lock; depending on the location of the trigger, rifles are classified into hammer and hammerless weapons. In the former, hammers are situated outside, and in the latter they are concealed inside the gun mechanism.

Break-open hunting guns have one or two barrels, less often three [1].

The firearms industry manufactures a large number of different shot guns models.

Remaking of small firearms usually involves shortening of their barrels and stocks. Sometimes, firearms are remade to use cartridges from other weapons. For example, the revolver chamber of one system is remade for using bullets of the other.

Home-made firearms are usually smooth-barrelled and manufactured with simplified firing mechanism. Most frequently

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[1] The third barrel, normally rifled, is situated under two-paired smooth barrels.

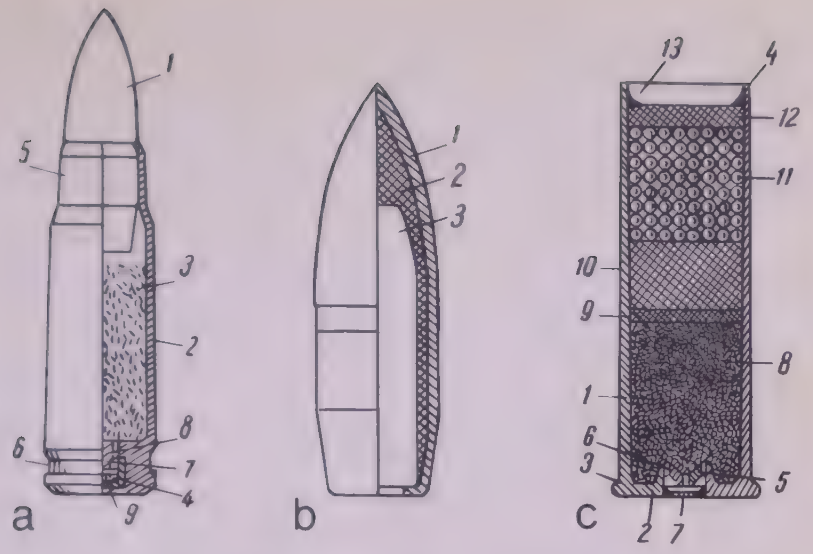

Fig. 17. a — design of cartridge for rifled weapon:

1. bullet; 2. cartridge case; 3. gunpowder; 4. primer; 5. muzzle end face; 6. annular bore; 7. anvil; 8. priming hole; 9. primer percussion composition.

b — general design of bullet for rifled weapon:

1. envelope; 2. lead jacket; 3. slug;

c — design of hunter's cartridge:

1. cartridge case; 2. rimmed base; 3. flange; 4. muzzle end face; 5. anvil; 6. priming hole; 7. primer; 8. gunpowder; 9. gasket; 10. gunpowder wadding; 11. shot; 12. wadding; 13. shot wadding reinforcement

they are designed for small-calibre cartridge. To mask the weapon, it is sometimes made in the form of a fountain pen, stick or some other item.

A *standardised cartridge* comprising a case, primer and shot of gunpowder is used to shoot all types of modern firearms. A hunter's cartridge also has gaskets and wads (*Fig.* 17).

Cartridge cases are made of metal (iron or brass), and for hunting shot guns also of paper. The latter are composite, the case being made of paper and the base of metal.

The muzzle end face, case and rimmed base are distinguished in the cartridge case. The bullet is loaded in the muzzle end face (correspondingly, a shot wad in a hunter's cartridge) and a gunpowder charge in the rimmed base (correspondingly, also gaskets and wad in a hunter's cartridge); the primer pocket is located in the centre of the rimmed base.

Depending on base design, cartridge cases are distinguished into rimmed ones, whose base diameter is greater than that of the chamber, and rimless ones, in which an annular groove is made near the base. The rim and annular groove serve to grip the cartridge case with the extractor claw when withdrawing the case from the cartridge chamber. The dimensions of the cartridge case, i. e. the length and diameter, and also the shape and design of the rimmed base, shall correspond to the chamber of the weapon it is designed for. The major diameters of the muzzle end face, case and rimmed base are larger than that of the calibre of the weapon; however, the minor diameter of the muzzle end face corresponds to that of the weapon, so the cartridge case has the same calibre.

Projectiles may be single (bullet) and multiple (shot projectile). The head, lead and tail parts are distinguished in bullets (except spherical).

Bullets may be jacketed, semi-jacketed and naked. Jacketed bullets have a steel envelope plated with tombac or brass, a lead jacket and a steel core. Semi-jacketed bullets have an envelope that does not cover the head part, and a lead core; and naked bullets are made of lead or alloys.

Jacketed bullets are used in military small-arms, semi-jacketed in hunting rifles, and naked bullets in small-calibre and smooth-barrelled hunting guns.

Depending on their shape, bullets are classified into pointed, ogival, and blunt-nosed.

Both general-purpose and special-purpose bullets are manufactured for military small-arms, for instance, armour-piercing, incendiary and tracer bullets. But the latter are rarely observed in investigation practice.

The diameter of the bullet leading part exceeds by 0.2-0.3 mm that of the bore; yet, the bullet is indicated by the same calibre, as the bore has.

Bullets for smooth-barrelled guns (except spherical bullets) usually have a tail piece in the form of a felt or wooden wad secured to the bullet.

Shot shells contain numerous round lead pellets called shot, instead of a single bullet. The pellets range from 1.50 mm (every 0.25 mm), to 5.00 mm in size, and shot over 5 mm in diameter is called canister.

Home-made grain, rolled wire, and cast shot are also used in practice.

Charge. Only smokeless powder is used in military small-arms cartridges, and sometimes black powder in hunting guns.

The *primer* serves to ignite the powder charge. It consists of a cap made of copper or brass covered with foil and supplied with percussion composition pressed inside. The primer is inserted in the cartridge priming pocket.

Wads. In shot shells, wads are used to pack the powder charge, and are usually made of felt. Fine cardboard gaskets are used to separate the powder from the felt, and cardboard wads are placed over the shot to reinforce the charge.

The felt wad diameter exceeds the cartridge minor diameter, and the diameter of the cardboard gasket corresponds to it.

Different-type cartridges are normally designed for specific weapon models and systems, e.g. for rifles, revolvers, pistols, etc. Nowadays, some cartridges are used to fire many weapon systems.

3. Mechanism of Trace Formation on a Bullet, Cartridge Case and/or Hit Object

Important circumstances may be established by studying gun-shot traces found at the site of the event.

The appearance of shot traces would depend on the regularity and relative stability of the events that happened when the shot was fired. In different samples of a given weapon, the intensity of ignition and combustion of the powder charge, and the combustion time, temperature, and pressure of powder gases at every shot would be about the same. This is due to the fact that firearms and corresponding ammunition are standardised. Again that is why gunshot traces are also relatively stable and may be used to establish certain details.

Three stages are distinguished in shooting: loading the gun, firing the shot, and extracting the spent cartridge case from the chamber or reloading the gun. Discharge traces may form in all stages. Hence, their forming mechanism should be examined in conjunction with their discharge mechanism (*Fig. 18*).

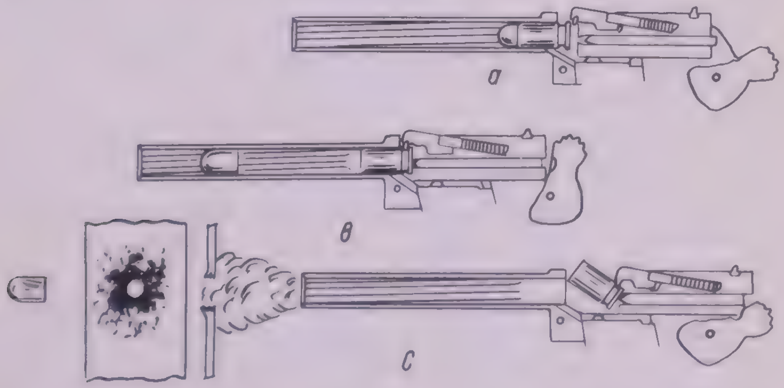

Fig. 18. General scheme of shot and resultant traces:

a — loading gun; b — firing a shot; c — ejection of spent cartridge case and resultant shot traces on object hit

Loading. Pull slide back, drive[1] cartridge into chamber, ram slide forward, and lock barrel. In this case, the firing mechanism is sear-notched, the main spring compresses, and the extractor claw jumps into the ring groove or behind the cartridge rimmed base to leave a dynamic trace on the rib in the form of traces from the extractor claw.

Discharge. To fire the weapon, press the trigger to make the firing pin come off the sear-notch to be propelled by the mainspring so that it hits the primer with the pin to form on it a volumetric static trace, reproducing the features of the pin's outer surface. The impact makes the percussion composition ignite to fire the powder. The powder burns to form gases and high pressure[2] to eject the projectile from the barrel. Inasmuch as gases press uniformly on all sides, they cause the cartridge case to be tightly pressed to the chamber walls (in revolvers, to drum chamber walls), and the rimmed base and primer to the front section of the slide, and in hunting guns to the block shield. The static volumetric traces arise when manufacturing and using the weapon. At the same time, powder gases press on the bullet head to drive it through the barrel. The bullet diameter is slightly greater than that of the barrel, and this causes the bullet to cut into the riflings and to deform.

In the initial period, the bullet moves rectilinearly to form on its envelope dynamic traces in the form of tracks running parallel to its longitudinal axis (primary traces). With further bullet motion, all the leading surface of the bullet envelope cuts into the riflings to form land traces (secondary traces). The number of traces left from the lands, and their direction, width and steepness (inclination to bullet parallel axis), correspond to the design of the rifled barrel. Hence, they may be used to determine not only the type, but the system of the gun as well. Besides, traces in the form of tracks reflect the microstructure of the land surface which may be used to identify the weapon.[3]

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[1] In modern firearms, with the exception of the revolver and break-open hunting shot-guns, the cartridge is rammed into the chamber from the magazine by thrusting the slide.

[2] In modern firearms, up to 3,000 atm.

[3] By bullets fired from smooth-barrelled guns one can determine only the approximate gauge of the firearm to authentically exclude the possibility that a bullet smaller than the one examined was used.

It is possible to identify such weapons by traces occasionally left by specific features of the bore walls on the bullet surfaces. Yet, this is made difficult by the fact that their diameter is less than that of the bore; they have ribbed surface (except ball-shaped bullets), and are ejected from the bore with

The bullet is discharged from the barrel at high velocity to fly in a given direction. If it encounters an obstacle (target) on its way, it causes destruction which we call a puncture.

When the bullet pierces a relatively hard obstacle, a trace is left on it from metal, oil, soot and other particles rubbed off the envelope.

Mechanical damages in obstacles may result from close-range shots or by the air column ejected by the bullet from the barrel, and also by powder gases discharged after the bullet. Molten powder gases, and/or muzzle end face flame resulting from close-range or near shots may cause punctures in the bore and thermal changes around the target, e. g. singeing of fabric or fleece.

Incompletely burnt powder grains and soot (solid residues of burnt powder and priming composition) also ejected from the barrel to a relatively small distance, having encountered an obstacle, could enter its surface and to deposit in the puncture channel when the shot is fired point-blank. Such changes in the puncture channel and around its inlet are called *close-range shot traces* (or additional shot traces).

When the shot is fired, powder carbon is deposited on the bore channel walls.

The gun is *reloaded* by pulling back the slide [1] to make the extractor claw press the rimmed base front surface and extract the fired cartridge case from the chamber. In moving back together with the slide, the cartridge case hits the reflector to be ejected from the gun.

When the cartridge case is extracted from the chamber, a trace from the extractor claw remains on the front surface of the rimmed base, and a reflector trace on the opposite side of the rimmed base. Both traces may be used to establish the system and individual identity of the weapon used.

When a hunting shotgun is fired, wads and gaskets are ejected from the barrel together with the projectile and the combustion products of gunpowder and priming composition.

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a wad. So, when the bullets pass the bore, they have no close contact with its walls and can rotate to enter into close contact only with some bore sections.

It is likewise possible to identify smooth-barrelled shot-guns by traces in the pellets arising when the latter rub against the barrel walls during the discharge. Investigation showed that on the extreme pellets traces caused by the microspecifics of the bore walls are formed, and that allows to identify the shot-gun.

[1] Nearly all the systems of modern firearms are self-loading, i. e. reloading occurs automatically.

When fired at a range of maximum 3 m, the shot charge would fly to make a single hole in the obstacle. When fired from more than 3 m one observes a scattering effect: each pellet forms a separate hole, whose forming mechanism and features are similar to those resulting from a bullet shot. On the other hand, a fracture formed by the entire shot projectile would be larger than the bullet hole, generally characterised by irregular rounded form with dented edges.

The traces of a weapon fired which are revealed on the scene of an event must be duly recorded. The traces should be described in detail in an inspection report, and then photographed, removed and appended to the file as real evidence.

4. Detecting and Inspecting Firearms and Gunshot Traces

Sometimes firearms are left on the scene of an event. Not infrequently, criminals hide them not far from the location where the shot was fired. That is why, in searching for weapons, the investigator should carefully survey the location by using, when need be, a metal finder or magnetic lift.

The place where the firearm is found shall be carefully surveyed to find foot-, footwear prints, transport tracks, etc. Handprints may be detected, too, specifically on the trigger and guard, slide casing, and other parts.

The inspection report relating to the scene of an event shall record in detail where the weapon was found, its position in relation to nearby stationary objects, and the general view and position of the firing mechanism to establish whether the slide is locked, trigger released, and cartridge or shot cartridge case in the breech are skewed. To avoid a chance shot, do not examine the state of the firing mechanism by pressing the trigger. Unload the gun or make sure it is not loaded. To that end, separate the magazine, pull back the slide, and check whether a cartridge is left in the chamber.

In visually inspecting a firearm, all its structural features, damage, and contamination should be described. On finding blood traces, parts of pia mater, and hair, their location, amount and other details should be indicated.

In inspecting firearms, their type, model, calibre, number and trade marks should be established; the condition of the bore walls should be also checked (signs of carbon and rust); also should be detected the presence or absence of powder gas odour, this being highly important for establishing when the shot was fired.

Having thoroughly inspected the firearm, the investigator should uncock the striking mechanism and tap the muzzle end face with a clean cloth. Then the firearm should be wrapped in paper and sealed to be stored in ordinary premises with normal room temperature and humidity.

Usually, the projectile (bullet, shot, or their substitude) is left on the scene of the event to stay either in the victim's body or in various other objects (walls, fences, trees, etc.). Yet, it is not always readily detectable when it pierces the obstacle. In that case, the direction of the projectile flight sometimes changes, and it can enter an obstacle located at some distance from the initial trajectory of flight.

To detect projectiles, one should first of all inspect the main object hit and the resultant hole. If the hole is through, one must inspect the neighbouring objects.

To find projectiles, one must sometimes establish their flight direction, and then attentively inspect all the objects situated on that line, especially dents and damages in walls, ceiling, and floor. In some cases, the investigator shall melt snow and screen ground to find bullets.

If there is reason to assume that several shots were fired, the investigator must do his best to find all the bullets.

When he finds a bullet, he should describe the object in which he found it, note its position and form, and also the hole size (diameter, depth) and its direction.

When possible, the projectile shall be removed together with the hit object or its part. If this cannot be done, the projectile shall be extracted from the object, but first a circle[1] shall be chalked around the centre of the hole. A bit or chisel to hollow out bullets or pellets from a wooden obstacle should be used, and a jumper exceeding the bullet size to hollow it out from a brick wall. When extracting projectiles, one should make sure they are not damaged.

When inspecting the bullet, one establishes its form, design, size (length and diameter), envelope colour, number of traces left by the bore lands, their direction, and pronouncedness of primary and secondary traces. One should also note whether the bullet is deformed and whether it has foreign matter on it (blood, cloth particles, obstacle particles, etc.). When inspecting pellets, their number, form, and maximal and minimal dimensions are to be established.

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[1] The circle shall be bigger in diameter than the hole. It is essential to establish the exact location of the hole and to determine the direction of the shot after damage caused by extracting the projectile.

Every bullet or group of pellets should be packed separately, and a corresponding inscription is made on the packing and certified by the investigator.

Modern firearms are chiefly automatic and cartridge cases are also often left on the scene of events. However, in various firearm systems, they are ejected in different directions.

When in flight, an ejected cartridge case may hit an obstacle to fly aside. As a result, sometimes it is very difficult to find it. In fact, cartridge cases are known to have been found on chandeliers, behind wall pictures, and under furniture.

During the inspection, the investigator shall specify the place where he found the cartridge case, its form, size, design, metal colour, markings on rimmed base, and other factory marks stamped on the cartridge case and primer. He should also describe the location and characteristic features of the traces on the cartridge case left by firearm parts, and note whether the powder combustion products have a specific odour.

Each cartridge case should be packed separately, and the packing should bear a corresponding inscription certified by the investigator.

When using hunting shotguns, wads or their substitutes, for instance, crumpled shreds of paper, fibre packing, etc., can be left on the scene of a crime. When inspecting these objects, the investigator should specify the material they are made of, their diameter and thickness, whether they bear dirty stains, and the place they were found. Every wad should be packed separately.

The hit object shall also be thoroughly inspected to establish its location, designation, material, and other specific features. The investigator should also carefully inspect the hole and the area around it, since it may also reveal gunshot signs. In inspecting the obstacle, the investigator should determine the number of holes and their location and basic features (dimensions, form, presence of traces of a close-range shot). In packing the part of the object with gun-shot traces, the investigator should cover it with a clean cloth, edges secured to the object. When the object hit is made of soft material, it would be advisable to wrap it so that the pierced segment is turned inwards.

5. Examining Bullet Holes and Determining the Direction and Distance of the Gunshot and Location of the Person Who Fired It.

In specifying various circumstances concomitant with a gunshot, the nature of the resultant holes has major significance.

The holes are classified into through ones, when the projectile overcomes the entire thickness of the obstacle involved, and blind ones, when it enters the obstacle to stick in it. Dents resulting from ricochets [1] belong to blind holes.

An inlet and bore are distinguished in a blind hole, and an additional outlet in the through hole.

Holes may form both within the bounds involving the action of the projectile frontal surface [2] and beyond them. The former form in relatively plastic materials, such as timber, iron and, chiefly, due to obstacle deformation, and the latter in brittle materials such as glass and brick, because part of the material is driven out of the obstacle. As a result, the size of holes in elastic materials is always less than the diameter of the projectile, and in brittle materials greater than the latter.

The bullet's inlet opening in elastic materials has the form of a funnel-shaped expansion, and the outlet opening represents inverted serrate edges, flakes.

In brittle materials, the inlet and outlet openings are funnel-shaped, with narrow sections directed one to another. The dimensions of the outlet openings are always greater than those of the inlet ones.

Holes in fabrics most frequently form because part of the material is hollowed out by the projectile to scatter the edges. The hole size may change owing to stretching of threads when the fabric melts. When a point-blank or close-range shot is fired, powder gases often make the fabric near the hole tear crosswise. In rubber and other elastic materials, the hole has the form of a slit-like flaw, by which one cannot normally specify the projectile parameters.

By studying bullet holes, the "contact ring" and the traces of close-range shots, one can establish the projectile type, calibre, frontal surface, and type of gunpowder used. It also helps to determine the direction of the shot and the distance and place from which it was fired. The investigator can establish all this, except the type of gunpowder, on the scene of the event. He could do that either alone or with the aid of an expert, and use the information obtained for operative and investigation purposes, or to prescribe forensic ballistic expert examination.

The type and number of projectiles that hit the object shall be specified by the number, size, and form of resultant holes.

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[1] Ricochet — rebound of bullet from obstacle.

[2] Surface of the projectile piercing the obstacle.

The hole in hard plastic materials, like also the "contact ring", corresponds in form to the projectile frontal surface. Hence, its contours may be used to judge about the projectile form and the type of shot (factory rolled lead, chopped nails, rolled pellets, or other type of home-made shot) with which the cartridge was charged.

Chemical analysis of powder soot allows to say whether the cartridge fired was charged with black or smokeless powder. If individual smokeless powder grains are detected, the analyst can establish its trade mark.[1]

To determine the direction of a gunshot, the investigator shall first specify the front side of the obstacle, and then the angle at which the projectile had hit it.

The front side is established by previously described puncture signs, and by the presence of a "contact ring" and traces of a close-range shot. Traces indicative of muzzle flame effects are revealed by such signs as singeing and twisting of fabric hair, browning, and friability of threads. On light surfaces soot is visible with the naked eye. On a dark fabric, it is revealed by using special methods. For instance, microscopy allows to see around the outlet opening accumulations of powder combustion products uniformly situated over a more or less considerable area, and also individual unburned powder grains. Infrared photography, and chemical, electrochemical and other technique are used for the same purposes.

The front side of a glass obstacle can be determined by the edges of glass fragments. When the projectile passes through a glass window, radial and concentric cracks develop around the hole to give rise to small unevennesses in the form of curved rays along the fragment edges. On the edges of radial fractures, the ray narrow ends are turned to the front side, and the edges of concentric fractures — towards the side opposite to the front side. Yet, these features serve to establish the front side of obstacles only when one can authentically judge how the glass sections examined were positioned in the pane before the shot was fired.

The angle at which the projectile hits the obstacle is calculated by the direction of the hole bore, which approximately corresponds to the direction of the flight line.

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[1] Every trade mark of smokeless powder is characterised by specific grain form and structure. For instance, rifle powder grains have the form of cylinders with one or several grooves, and pistol powder viscose grain the form of little sausages, etc. The grains of hunter's smokeless powders normally have the form of plates of various sizes and forms.

The firing range, i. e. the distance between the muzzle end face and the obstacle, may be established with relative accuracy provided the object bears traces of a close-range shot.

For small-arms and sports guns, scorching is observed when the shot is fired at 5-10 cm; soot deposition up to 30-40 cm; and individual powder grains can penetrate at distances of up to 80-100 cm, sometimes even farther away. For hunting shotguns, if charged black powder is used, scorching is occasionally observed at 50-100 cm; soot deposition at distances of up to 150-170 cm; and powder grains can be observed when the shot is fired from up to 2-3 m and more. When the shot involves smokeless powder, the above parameters are slightly less.

In performing an expert examination, the firing range should be established by examining the object hit, and by firing experimental shots at the same obstacle from the same weapon system (or model) using the same cartridges.

Chemical analysis of the gunshot products deposited on the obstacle around the inlet hole may also be used to determine the firing range. The products include many components, such as stibium, tin, copper and other metals. Spectrographic research, and particularly activation neutron analysis of the gunshot products removed from the obstacle around the hole to establish therein the relative amount of those metals would allow to estimate the firing distance quite accurately.

The position of the shooter is determined by evidence on the direction and range of the shot, or by sighting two damages caused by one projectile, or by sighting the bore made by one bullet.

In the first case, observation is performed along a straight line connecting the centres of both damages. The result proves quite accurate if the shot was fired at a relatively close range, since the bullet flight line was virtually close to a straight line. But when the shot was fired at a long range, the position of the shooter shall be specified by performing calculations of the projectile flight trajectory. When through holes are situated close to each other, the investigator shall insert a paper tube to conduct his observations. But when the second hole is far away from the first one, he shall connect them with a cord with sticks tied to both ends so they would press to the hole edges. Observations shall be performed with cord stretched.

The direction of the shot and position of the shooter may be estimated by one hole only when the bore is relatively deep.

The direction of a shot with reference to a deep blind hole shall be specified by the spatial position of a rod inserted in that hole, rod diameter being much smaller than the hole diameter.

6. Identifying the Firearm Type, System and Model by Fired Bullets and Cartridges

By examining fired bullets and cartridges found on the scene of an event, one can infer the type, system and model of the weapon from which they were fired, i. e. establish to what group they belong. After the weapon was found, the investigator shall identify the model.

These investigations are assigned to expert criminalists. Only in individual cases, specialists would draw conclusions on the scene of the event to specify the weapon system by the fired bullets and cartridges. However, these conclusions cannot be considered evidence.

The weapon system may be determined by the design of the bullet and cartridge case, and by the shot traces thereon.

The task is to establish that the given bullet and cartridge case belong to a specific type of cartridge designed for a given system or group of firearm systems. In this case, the investigator shall take into consideration: (1) the general design of the bullet (full-jacketed, semi-jacketed, naked); (2) the shape of its front and tail sections; (3) size (diameter and length); (4) weight; (5) material of which it is made; (6) type of bracing with cartridge case and some other features (shape of base and marking).

By examining the cartridge case, the investigator shall establish: (1) its form; (2) rimmed base design; (3) size, including minor diameter of muzzle end face; (4) weight; (5) type of bracing with cartridge case; and (6) marking on rimmed base, primer, and casing.

The information obtained shall be compared with the data in reference tables and cartridge collections.

By studying traces on the bullet, the investigator shall determine the number of riflings in the bore, and also their direction, width and inclination; he shall use the traces on the cartridge case to determine the reciprocal arrangement of the extractor and reflector, and their dimensions and form.

The general rules of criminalistic identification shall be used to identify an individual weapon by traces on shot bullets and fired cartridges. Weapon details are characterised by microrelief whose aggregate features allow to individualise them and the weapon as a whole. The microrelief of bore walls, which with every shot is exposed to high temperature and pressure, chemical effects and mechanical loads, is relatively stable and allows to perform indentifications by firing several dozen shots. The microstructure of other weapon parts is even more stable.

The microrelief of weapon parts leaves its traces on the bullet and cartridge case when they interact during loading, firing, and ejection of spent cartridge case.

By comparative examination of traces on the above-mentioned objects with the microrelief of corresponding weapon parts, one can identify those parts and, consequently, the weapon itself.

The examination sometimes allows to directly compare the microrelief of the trace and part, for instance the trace on the rimmed base and primer of the cartridge case from the slide front section with that on the particular section. Yet, the examination is most frequently performed by comparing corresponding traces on either bullets or cartridge cases collected on the scene of an event or those obtained by control shots. Experts obtain control bullets and cartridge cases by firing shots at bullet traps (packed with cotton or filled with water), in which the bullet velocity is damped without altering the microrelief of the traces.

In identifying weapons by shot bullets and cartridge cases, several methods are used. The most convenient and widespread one involves comparative microscopy. The parts of corresponding traces are compared microscopically to allow, in one land divided into two halves, to instantly observe two objects, move them in any direction horizontally to find coincident features, and photograph them, when need be.

The method of superimposing photographs is also often used. First, magnified pictures of the same scale are taken of traces on the given bullets and cartridge cases to then compare them by superimposing the photographs (Fig. 20).

Several methods are used to make photographs:

(a) taking pictures of traces on examined and control bullets and cartridge cases, for example, by scanning their surfaces with a special camera;

(b) first obtaining imprints of traces on plastic material (for example, rolling the bullets over a wax compound or fusible metal) and then photographing them. At present, polymers are used to obtain casts of traces on bullets and cartridge cases.

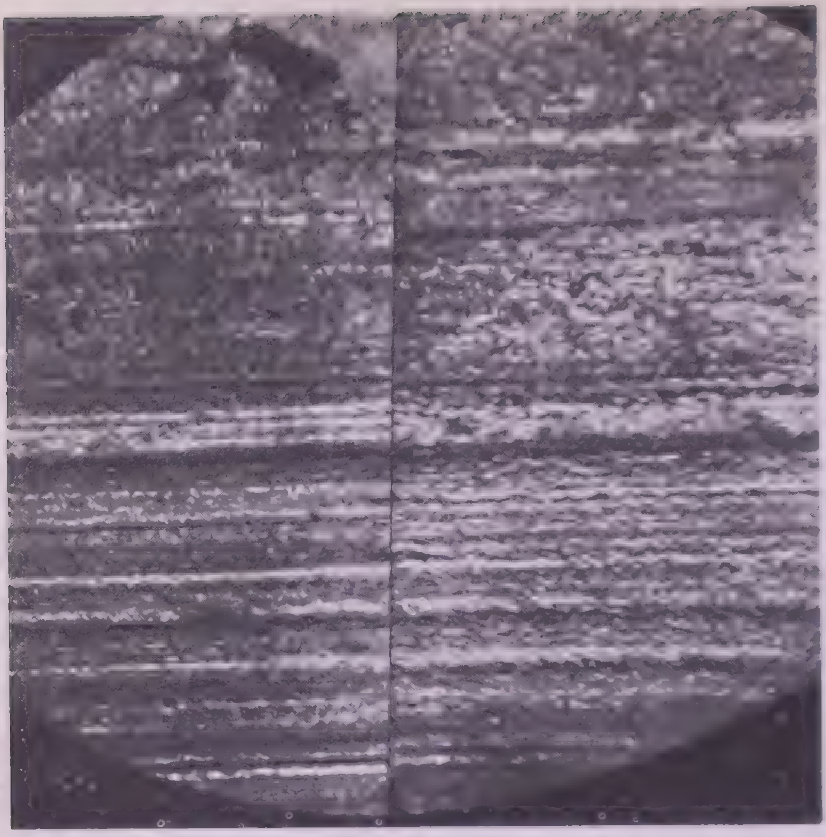

Fig. 19. Coincidence of traces from microrelief of bore walls on bullets:

a — extracted from victim's body; b — control bullet fired from the weapon under examination

Investigators also directly examine traces or impressions by optical and photoelectric profiling.

These methods are essentially designed to obtain trace profile images, i. e. a curve showing a magnified trace microrelief that allows to reveal the depth of the traces compared and to use this third dimension to substantiate conclusions on the presence or absence of identity.

Trace profiling results in profilograms used for making comparison. Profilograms may be mathematically processed which makes it possible to draw conclusions, by means of mathematical calculations, on whether the traces are identical or not.

To make a positive conclusion that weapons are identical, one must establish the coincidence of individual totalities of features in corresponding traces on examined and control bullets or cartridge cases.

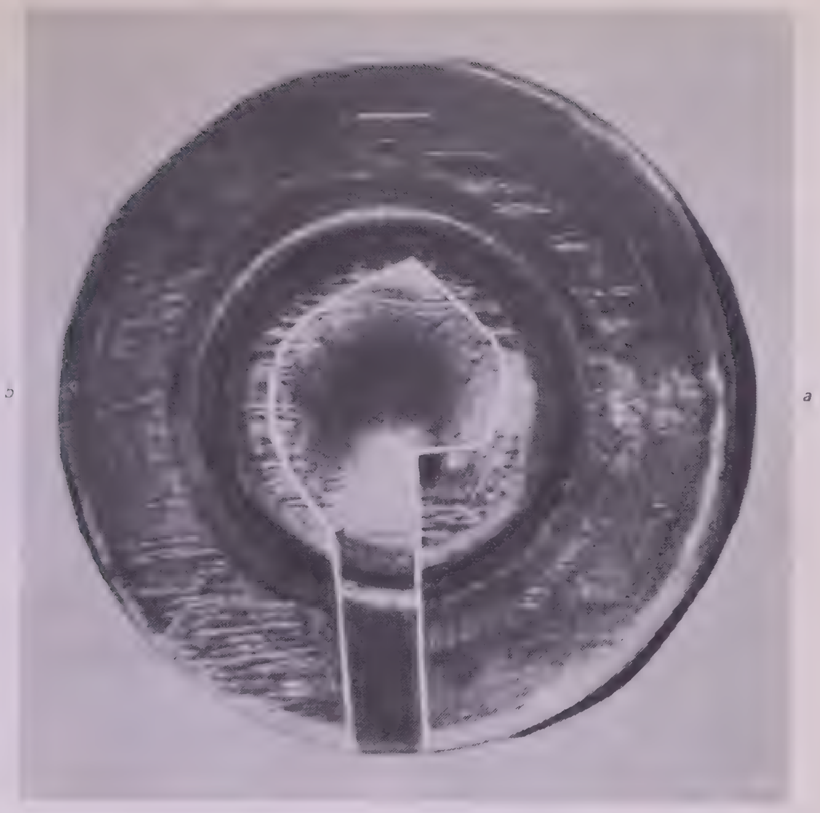

Fig. 20. Coincidence of traces from microrelief of slide shear on cartridge case primers:

a — found on the scene of event; b — control cartridge fired from the pistol under examination (method of superimposing pictures)

7. The Criminalistic Examination of Shot, Canister and Wads

The shot or canister removed from the scene of an event should be examined to establish how they were made (either industrially or at home, and in the latter case either by chopping, rolling or casting). The conclusion is made upon examining the outer features of the objects studied, viz. their form, size, weight, surface structure, etc., and also upon receiving data on the spectrographic analysis of their chemical composition.

The above features may also be used to comparatively examine two groups of objects, viz. those collected on the scene of an event and those found on suspects, in order to establish whether those objects were homogeneous or not.

If the combination of signs of compared samples indicates that the shot or canister were made from the same piece of lead or that their surface was processed by the same tool, or stored in the same place (as occasionally shown by characteristic soiling of the surface of the pellets examined), one could infer that the objects compared are of the same origin. If an expert draws this conclusion, it would lend additional weight to the investigation.

By examining wads, the investigator can establish the approximate gauge of the shot involved.

Wads are also examined to establish whether the material, manufacturing technique and greasing [1] were the same.

Techniques involving the study of traces are used to examine home-made wads. These could include individual identification of the tool used to make (punch) the wad, and identification of the whole by its parts (when the piece of paper used as the wad coincides along the separating line with the piece found on the suspect).

8. Other Forensic Ballistic Investigations

In addition to the above investigations, most frequently used in practice, forensic ballistics is also used to decide some other questions, for instance:

(1) whether a given object is a firearm; this question could arise in examining a home-made weapon manufactured in simplified form to copy a known model. Not infrequently, a home-made weapon is made to look like the object which actually conceals it (ball-pen, stick, etc.). The question is resolved by studying the mechanism and the individual parts of that device to see whether it can actually ignite gunpowder, eject a projectile, and develop striking power;

(2) whether a given weapon can go off without pressing the trigger, say when it drops, hits a hard object, etc.; this question is significant in establishing how the shot was fired, especially when verifying a version involving a chance shot. A conclusion is drawn after making sure that the individual parts of the firing mechanism are in order, and taking into consideration the structural features of the weapon system involved;

(3) whether a shot can be fired from a given type of weapon; this question is important in establishing its possible use as an instrument of crime. A conclusion is made by examining the

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[1] Greasing means coating of wad side surfaces with fats. It is designed to seal the cartridge more tightly and prevent powder from decomposing, and also to lubricate the barrel walls when firing a shot.

interaction of all firing mechanism parts, and after making sure its individual elements are all present and in good order. The results of this examination shall be checked by firing control shots;

(4) whether the shot was fired from that weapon, and specifically with what powder (black or smokeless). A conclusion could be made by chemically analysing the scale from the bore walls.

The weapon shall also be examined to establish its system or model, to reveal filed-down or hammered numbers and/or markings, to specify when the shot was fired and also to determine whether some part belongs to this very weapon, and to clarify some other points.

Bullets, cartridge cases or their parts are sometimes examined to establish causes of deformation and/or fragmentation. In the latter case, the investigator could assume that some part belongs to a specific type or model of bullet or cartridge case.

CHAPTER X

THE TECHNICAL CRIMINALISTIC STUDY OF DOCUMENTS

1. The Concept of the Technical Criminalistic Study of Documents. Types and Tasks of the Study

In the broad sense of the word, documents are objects, in which some technique was used to record circumstances (facts) significant for establishing the truth in a given case. Depending on the technique used in recording evidence, the documents are classified into written documents, and photographic documents, motion-pictures, and phonograms. In practice, criminalistic research most frequently involves written documents which serve as real evidence.[1]

The materials used for making documents are normally classified into standard and nonstandard. The former involve paper (writing paper, newsprint, wrapping paper, etc.), cardboard, ink, ballpen filler, Indian ink, stamp and printing paint, ink for felt-tip pens, and typewriting ribbon and carbon paper colouring agents. The latter involve plywood, boards, fiber, blood, substances used in cryptography, and the like.

Documents may be characterised by size, form, appearance of materials, protective agents, text (address), signatures, seal (stamp) impression, and presence of endorsement. The elements (properties) of numerous official documents issued by institutions and enterprises are specified by respective instructions. The elements of unofficial documents depend on their designation. Quite often, documents relating to criminal proceedings contain only one element, the text.

The investigator or court may want to specify not only the author and executor of a given document, but to reveal hardly visible and invisible initial notes, specify the manufacturing technique involved, establish the alterations which were made in the contents of a document and the method used, establish the time when the document was made, the identity of the seal (stamp) by its impressions, or the identity of the typewriter, electrographic device, and/or printing machine by corresponding texts. These questions shall be solved by criminalistic examination of documents.

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[1] Only written documents are implied below.

Special knowledge for performing such examinations is accumulated by synthetising the evidence and methods of physico-technical, chemical and other sciences on the basis of criminalistic methodology.

The tasks to be solved by the technical criminalistic examination of documents may be conventionally classified into:

(a) *identificational*:

to identify a whole document by its parts (fragments);

to identify a seal or stamp by their impressions, or a typewriter by the typewritten texts;

to determine the group to which various writing materials belong (the trade mark of a pencil, paper, etc.).

(b) *nonidentificational*:

to establish the method used in making a document or its individual elements;

to establish the alterations which were made in the contents of a document, and the methods involved;

to restore hardly visible and invisible initial notes; and

to establish the "age" (absolute and relative) of a given document.

The subject of the technical criminalistic expert examination of documents does not involve the need to establish their authenticity or fraudulence. This is a legal matter to be solved by the investigator and court alone.

Only technical issues are in the competence of the criminalistic expert. For instance, the expert shall establish that a given entry was changed by writing one digit instead of another; while the investigator and court shall specify the reason for the change performed, i. e., whether it was made, say, to correct some mistakenly made entry or conceal some misappropriation.

Investigatory Survey of Documents.

The need to keep the outer appearance of a document intact as real evidence requires that the investigator take all necessary measures to protect it from damage or other change. Such documents shall not be filed; they shall be kept in a separate envelope and bent only along existing folds. Old and torn documents shall preferably not be glued to the backing, but rather be placed between glass or celluloid plates with edged margins. Such documents shall neither be clipped nor contain notes made with either pencil, pen, or other sharp object. When mailed, all documents shall be inserted in compact envelopes in-between clean sheets of paper.

Documents attached to the file represent real evidence subject to survey in two stages: (a) involving careful study of their contents to reveal possible contradictions, and (b) to see whether they were subjected to changes.

Contradictions in the contents shall be established by comparing the individual elements; printed forms, impressions of seal and stamp, and the document issuing date with the date of priority forms. The date when the document was issued cannot antedate the form's printing time.

To reveal the features indicative of possible changes in the document contents, it would be advisable to apply technical devices, e. g. magnifying glasses, lights (infrared, ultraviolet), measuring instruments, light filters, etc.

It is advisable not only to study a document in diffused, but in vertical and obliquely incident light which reveals ruffled fibres, pressure traces and tracks formed by writing appliances. By examining a document in light, the investigator can detect local thinning of paper due to erasures. A magnifying glass can help to reveal doubled strokes, and blurring of the dye on the erasure sites and folding lines and also reveal dye particles and other features characteristic of changed entries.

In examining typewritten texts and seal or stamp impressions, it would be useful to use rulers and dividers, which allow to establish the difference in letter size (height and width) and in the distances between letters. In every word of the text in a seal (stamp) made in a state-owned engraving shop, letters are spaced equally from one another, and longitudinal axes in round stamps along the circumference radii. Consequently, deviations could indicate possible additional letters in the typewritten text, and possible use of home-made cliches in impressions.

Document survey conditions and results shall be described in detail in the record. Features of interest to the investigator may also be recorded photographically.

2. Examining Documents to Establish Change in Their Contents

The most widespread methods for changing the contents of a document are by erasures, addition of new letters or words, etching, and washing out.

Erasure is a way to mechanically remove strokes, e. g. by a sharpened hard object (knife or razor edge, needle or rubber). By erasing one can remove elements of characters (letters or digits), fragments of a given text, seal (stamp) impressions, signatures, and other elements.

Signs of erasures are: disturbed texture of the paper surface layer (ruffled fibres, loss of glitter); thinning of paper on the erasure site; distorted ruling or protective netting and nearby strokes; blurs and deeper penetrations into the paper of ink in the strokes reproduced on the erased entry sites; remains of strokes of the initial text in the form of particles of the dye unrelated to original entries. Traces of mechanical effects are sometimes concealed by smoothing out (polishing) the paper fibres by some smooth object. As a result, characteristic tracks develop.

The disturbed paper texture is readily revealed microscopically in oblique light. The microstructure of the stroke substance and deformation of lines in the protective and ruling netting are examined by magnifying instruments (magnifying glasses or microscopes). Thinning of the paper is distinguished in transmitted light (the erased spot looks lighter). To reveal erased entries, a number of techniques is used, viz. contrastive photography, colour discrimination, photography of visible (excited by UV rays) and IR (excited by blue-green rays) luminescence, photography in reflected IR rays, scattered copying, adsorption-luminescent [1], and other methods.

To make additions to a text implies changing the initial contents of a document by introducing new letters, digits or other elements or words and combinations of words in intervals between some characters, words or lines; adding words or digits under a line, over a line, or in an empty place in a line, and also making additional drawings, say, by changing the figure "1" to figures "4" or "7", and letter "o" to "a" or "g".

Signs of additions would involve difference in colour and shades of the strokes of initial and new entries, in a different arrangement of individual entries; narrowed or enlarged spaces between letters, words, and lines; unjustified abbreviations; difference in stroke width and in normal handwriting; difference in absorption of invisible rays (X-rays, UV rays, and IR rays);

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[1] The adsorption-luminescence technique consists in surveying visible luminescence (excited by ultra-violet rays) of impressions from the surveyed site of the document, the said impressions having been obtained on material that intensifies luminescence outlet when special organic solvents are used.

difference in stroke luminescence and impressions; presence of admixtures in some strokes and their absence in others; and difference between penetrability of writing material and copying ability of stroke colouring agent.

Sometimes, additions to the text can be revealed by examining the contents and detecting logical contradictions in the document with account for the meaning involved in its various individual elements.

Different arrangement of additionally made entries, and different colour and shade of strokes and quality of paper, may be revealed by examining the document with a magnifying glass or microscope in scattered and oblique light. Distinctive features characterising the difference between the properties of the material used, the main text and the text additionally added to the document shall be revealed spectrophotometrically, photographically in X-rays, UV-rays and IR-rays, by the infrared luminescence method and by using paper and thin-layer chromatography, chemical reactions, and other techniques.

When simultaneously making several carbon copies, the fact that additions were made after separating the copies from the matrix and from each other shall be established by comparing the relative arrangement of the entries in the original and copies, using a special optical superimposition device, or by superimposing the documents compared in transmitted light.

Etching implies bleaching of strokes by subjecting them to chemical reagents that can decolorise dyes (acids, alkalis, oxidising agents). Etching may be performed by consecutively applying different reagents.

Etching would essentially involve distorted size of paper to cause its porosity, hygroscopicity and dullness; change of paper colour in the etching sites, often to yellowish shade; forming of cracks due to brittleness caused by etching; bleeching or change in colour of protective netting, ruling lines and strokes of neighbouring entries or those executed on the site subjected to etching; remains of poorly visible strokes of initial entries; different luminescence in the site subjected to etching and in the remaining surface of the document; acidity or alkalinity of the medium; and presence of ions of etching substances on the sites subjected to etching.

Different changes in paper, colour and/or structure, weakly visible initial entries (of brownish, yellowish, or greenish colour), spots of etching substance, bleaching of protective netting, and some other signs of etching are revealed either with the naked eye or by using a magnifying glass and/or microscope. The degree of contrast of weakly visible strokes could be intensified when surveying the etched site with corresponding light filters selected according to the rules of colour separation and colour distinguishing. The method of fluorescence in ultraviolet rays, which allows to reveal the difference in the glow of residues of removed strokes and paper (background) can also help to detect signs of etching. The results of this method may be enhanced by preprocessing the document examined with luminophore, and also by studying it under low temperatures, for instance, in liquid nitrogen at —194° C.

Entries bleached by etching may also be revealed by contast photography, colour photography, and infrared fluorescence photography.

Various solvents may be used *to wash off* the stroke substance from the document surface. Many features characteristic of etching also develop in washing. They are often revealed and fixed by techniques previously recommended.

There are also other ways of changing documents — regluing of pictures and stamps are especially widespread among them.

Regluing of photographic pictures is most frequently done in identification documents. In this case, the original picture may be replaced either completely or partly. In the latter case, part of the original picture is left with the impression of the stamp, and the rest is removed and replaced by a new picture. Signs of reglued pictures may be readily revealed by special physico-technical and chemical methods.

3. Reproducing the Contents of Documents

Investigation and court practice often involve documents, in which entries are weakly visible or invisible due to natural ageing, careless storage, and various accidental causes and premeditated actions. Among documents whose text has to be restored are, for instance, those whose entries are poured over with ink, crossed out and covered with colourless pressed-in strokes, and also burnt or torn documents.

A successful *revealing of an entry* poured over with some substance would largely depend on the physical and chemical properties of the substance of the strokes and spots which cover the entry. The following are the most widespread techniques for revealing concealed entries:

— colour distinguishing photography, i. e. one involving a light filter. Its efficacy is directly dependent on correctly selected light filter, light source and photomaterial;

— infrared photography shall be performed when revealing writings made with a substance that absorbs those rays (graphite pencil, Indian ink, carbon paper, typewriter ribbon, printer's dye) but is poured over with aniline ink;

— X-ray radiography is used when an entry is made with some dye composed of elements with a big atomic number, and when the stain is formed by a substance with elements with lower atomic number;

— schlieren photography is effective when the difference between the optical density of the part of stain with strokes and the rest of it is clearly obvious;

— photography in oblique light shall preferably be used when stain parts with concealed strokes underneath give off light otherwise than the rest of the stain surface.

Good results are produced by infrared photography, and when using the diffuse-copying and adsorption fluorescence methods.

The diffuse-copying method is recommended for detecting texts written with water-soluble substances (ink) and covered by water-insoluble substances (Indian ink, carbon paper, and printer's dye). A discrimination solvent should be used to copy by the adsorption-fluorescent method. A stained text can occasionally be revealed by chemical bleaching of the stain, and also by colour chemical reactions that cause differences in the colour of the strokes and stain.

Crossed-out entries are revealed chiefly by the same methods as those used in revealing stained entries.

Detecting Faded Entries. Faded entries are those that have become weakly visible or invisible owing to natural causes (high air humidity, direct radiation, atmospheric gases, etc.). Entries whose substance contains aniline dyes can be detected when using fluorescent and infrared photography, colour distinction, and the diffuse-copying and adsorption-fluorescent techniques. Fluorescence would significantly grow when the document is radiated by a laser or when it is observed through an electronic optical transducer.

Sometimes there is need *to detect entries consisting of pressed-in strokes* formed by a writing device on a sheet of paper used as a base. In this case, strokes can be distinguished depending on the writing device, pressure applied, and base properties. Documents in which entries were formed by pressure traces must be examined in the dark, using a source that produces a narrow beam of light directed under a small

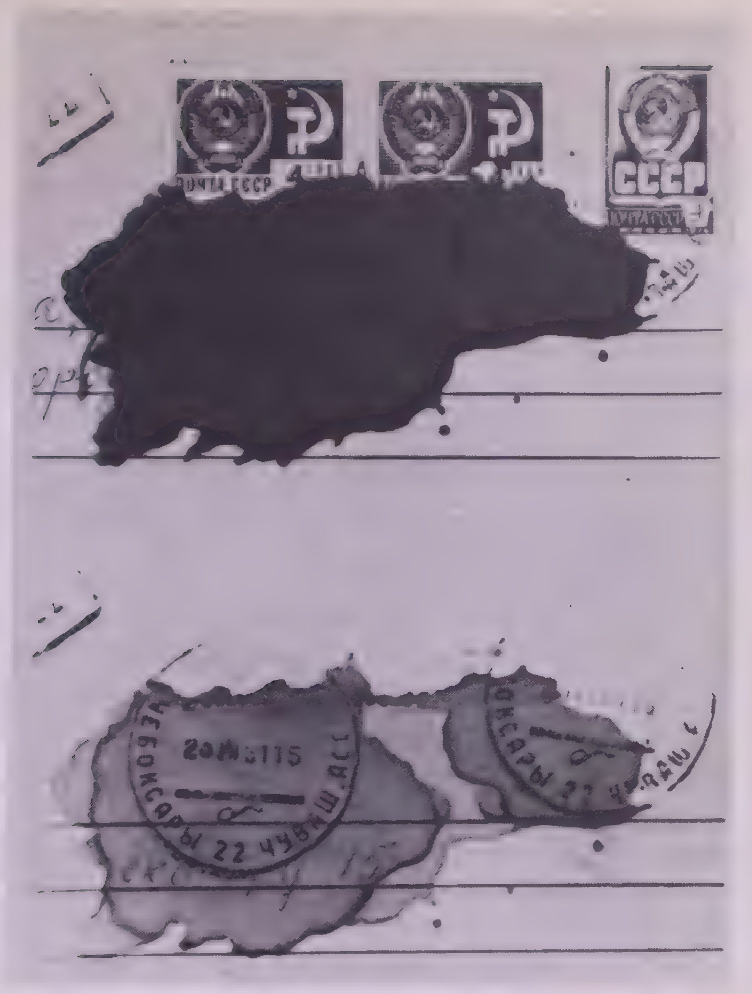

Fig. 21. Restoring a text by IR photography

angle to the surface of the document examined. To detect entries formed by pressure traces, it is recommended to use such effective methods as dusting the document with a dry, fine graphite powder or hydrogen-reduced iron oxide.

Detecting Entries on Burnt Documents. Under high temperatures, the materials of which a document is made substantially change their properties to acquire new ones.

The possibility to reveal entries on burnt documents would largely depend on the composition of the paper and the stroke dying substance, and also on the intensity and time during which the paper was exposed to high temperatures. Under 500° C, it would become brittle and crumble even when slightly touched, so it would be impossible to reveal entries on documents in that state. In favourable cases, one can restore entries on charred documents subjected to + 150-250° C. Dyes based on graphite and soot, and on mineral dyes (black printer's and stamp ink, graphite pencils, and logwood ink) are most resistant to heat.

One should take great care in collecting charred documents, since they are highly brittle. Relatively big shreds of burnt paper should best be handled either manually or with pincers that have no sharp edges. Small pieces of paper may be collected with a rubber pear or electrified celluloid rod. Incinerated documents and ash should be handled with a dust pan.

Prior to examination, burnt documents must be straightened out so that entries could be revealed. To that end, the examiner shall preferably treat them either with a 10-20 per cent aqueous solution of glycerine or with water vapour. In the latter case, the document shall be placed on glass and spread immediately after moistening. Photographic investigation methods are most effective, notably in vertical, oblique and diffused light, and in infrared rays, for they allow to detect entries owing to different reflection capacities strokes and background, and also by the remaining pressure traces. Normally, this would involve a set of techniques.

Not infrequently, burnt documents are examined to establish their type and quantity. As a rule, the type is specified by the content of revealed entries and, sometimes, by the specific composition of the paper.

4. Detecting Signature Forging Techniques

Signatures are most often forged by various preliminaries involving different technical means and methods. The most frequently observed one involves preliminary copying of the true signature. This is done by the following methods: copying with subsequent tracing; copying by carbon paper; pressing with subsequent reproducing of pressure traces; copying by means of substances with copying ability (by making an intermediate cliché); and by the photoprojection and photomechanical techniques. With the exception of the photomechanical technique, the above methods result in wavy strokes and angular ovals. Various methods for drawing copies of signatures, including one involving the pantograph are characterised by presence of preliminary pencil strokes.

Photographic forging is characterised by complete coincidence of the examined signature with the one from which a photocopy was obtained; both enlarged and diminished signatures prove fully commensurate.

The photomechanical method is usually used to make facsimiles. Signatures made by the facsimile method have stroke microstructure specific of metal clichés.

Many signs of fake signatures can be detected when examining a document in oblique and scattered light. Pencil strokes contoured by aniline ink shall be observed with the aid of an electronic optical transducer. A laser should preferably be used to intensify the illumination of the document.

Signs of retarded movement, double strokes, dye blurs, retouching traces, and microstructure are detected and fixed photographically (macro- and microphotography). Traces of pressure are photographed in oblique visible light or in infrared rays. Signs of pencil preliminaries and preparations involving carbon paper should be detected by infrared photography. Expert examination is often conducted to decide whether or not a given signature was used as a sample for subsequent copying, for instance through carbon paper. To that end, the investigator should superpose the slides of the signatures compared.

In all cases of expert examination of signatures, they should be compared with sample signatures of the person in question. To that end, free and experimental signatures of the person should be presented to the expert. Six to eight signatures executed on documents of approximately the same material quality and dating should be presented for examination as free' signatures. Among them must also be signatures resembling the examined one in transcription and configuration. Experimental samples (as many as about ten) shall be executed on a clean sheet of paper with the same pen (either fountain or ball point) and the same ink or pencil as those used to make the original signature.

5. Studying Impressions of Seals and Stamps

Seals (stamps) are made of rubber and metal.

Forged seals are observed most frequently in the form of flat, drawn or copied printing forms or relief seals made by engraving or from printer's letters. The seal impression is drawn directly on the fake document.

Impressions from drawn cliché are characterised by the following features: different configuration of the same letters and figures; deviation of letter axes from radii of impression circumference; broken lines; non-uniform intervals between letters, words, and lines; tortuosity and thickening of strokes; radiance of individual letters; low concentration, non-uniform distribution, and blurs of dye in strokes; and dissimilar fluorescence of the site of impression and the rest of document.

A dye for making fake impressions is made by the copying of the true seal on an intermediate cliché. The impressions of such a dye without subsequent contouring are found to have coinciding shapes, sizes, impression details, configuration and relative arrangements of characters with weak colouring of strokes, blurs of dying in those strokes, absence of paper gloss, distinctive fluorescence of impression site compared with that in other sites, and presence of strokes unrelated to seal image, but copied with it.

Impressions made by clichés cut from soft material, in addition to signs inherent in drawings of characters and their relatively disturbed arrangements, are also characterised by non-coloured sites from cuts along the edges of characters, inclined angles in places where character strokes are connected, broken oval lines, acuminate stroke endings, "dents" along stroke edges, etc.

The impressions made by clichés cut from solid material (linoleum, wood) are also characterised by the same features. Yet, they differ in microstructure of the dying agent between the strokes. In strokes of cliché impressions from solid material, one can observe non-uniform distribution of the agent characterised by multiple "gaps", and its emergence beyond the stroke boundary. In impressions of clichés of printing letters, one may observe letters which differ in pattern and size. When the letters are poorly set, they may be turned upside down and displaced in relation to the circumference radii.

Images of a drawn impression are noted to have double strokes, grooves from writing implements (pen or drawing pen), and occasional punctures from divider arm (compass leg) in the centre of the impression.

These signs are found in examining documents with magnifying instruments, scale nets and protractor, while changes of paper properties from moistening and contact with the cliché surface are observed in oblique light, also by radiating the document with ultraviolet rays.

Every seal has a set of stable features that appear when the seal is made and subsequently used to allow to distinguish it from other similar objects. By studying impressions, the investigator should decide what concrete cliché they were made with. When examining impressions, the expert must first of all reveal signs of how the cliché was made. Relevant distinctions are sufficient to infer that the impressions were made with different seals.

When clichés are made by the same method, they are further examined by identifying and comparing their common and specific features to help establish the original seal. Common features include: contents, shape, diameter (length of seal), arrangement of fragments in relation to the centre and base of the seal, shape and direction of lines, and configuration of letters and spacing between them. Specific features include arrangement of text and individual characters in relation to each other, minor details in those characters, and microrelief.

A comparative study requires samples of impressions of the assumed seal. These are classified as free and experimental. Free samples are presented as eight-ten impressions with the same dating as the document examined. The same number of experimental samples obtained on the same brand of paper as the original document must be presented; the cliché should be pressed with varying intensity, and the dying agent between the strokes should also be characterised by different concentration. The impressions should be made with a dying agent similar to that used to make the impression on the document examined. If the cliché is soiled, the impressions should be made both before and after washing it. The sample must be certified by the official who had prescribed the examination, and the conditions in which they were obtained should be indicated in the corresponding resolution, appended report, or on sheets of paper bearing experimental impressions.

6. Examining Typewritten Texts

Typewritten texts are objects of criminalistic investigation designed to establish the typewriter model, the executor, the number of copies made in one batch, and also the way their contents were changed.

Typewriters are subdivided into classes (electrical and mechanical), types (office, portable, travelling and special-purpose), systems, and models, and are characterised by common and specific features.

Common features include the pitch of the main mechanism, the spacing between lines, the keyboard, the characters, and the typesize.

The pitch is the distance over which the typewriter carriage moves with every stroke. It can be established in various ways. For example, the space between similar characters located in the beginning and end of a line is measured with an accuracy of up to 0.1 mm and then divided by the number of characters (including the intervals between words that may equal one, two and more characters) to obtain the sought value. Measurement accuracy is checked for several lines, using special templates in the form of nets. Depending on the typewriter model, the pitch would range from 2.12 to 3 mm.

The spacing between lines, i. e. the distance over which the carriage roller travels to move to the next line, is measured by points in the same letters located on neighbouring lines of the typed text. Non-uniform spacing is indicative either of switched-off or faulty mechanism.

Typesize is distinguished by dimension (height, width) and pattern. It is classified into pica, medium and élite, the height of pica being 2.25 mm and higher, and that of medium and élite ranging from 2.0 to 2.25 mm, and up to 2.00 mm, respectively. Types 2.64, 2.30 and 2.20 mm wide belong to broad, medium and narrow sizes, respectively.

The width of typewriter characters is estimated by measuring the distances between the axes of the character vertical strokes, and their height by measuring the distance between the cut-offs with a microscope or magnifying glass. These sizes would depend on the intensity of the stroke, quality of the typewriter ribbon and carbon paper, and also on the state of the roller.

Similar characters in different types differ not only in size, but in shape of specific characters or their elements.

Specific features are caused by defects in mechanisms and type. The former include vertical and horizontal displacement of certain characters; deviation of character vertical axis; faulty intervals; non-uniform colour of impression; unparallel lines of bases (apices) of small and, correspondingly, capital letters; non-parallel lines.

Specific type features also show in crooked character elements, loss of cut-offs, and occasionally expanded stroke sections.

By studying the common features of a given typewriter, one can assign it to a particular class, type and group of systems. Again, the totality of common and specific features would allow to specify the model used to type the text.

In typewriters used intensively for a long time, many of the above-said features are distinctly pronounced, and may be revealed when comparing specific typewritten texts, and also when measuring and microscopically scrutinising a given text by examining enlarged photographs. One way of doing that is to superpose one-scale magnified slides bearing the text of a given document, similar in content and arrangement, over an experimental sample typed on the typewriter subjected to inspection.

The possibility to reveal specific features in new typewriters becomes much greater when the examined document and the samples are photographed in high-frequency currents and subjected to feeler profiling, and to the effect of an optical quantum generator.

Expert identification of a typewritten document would also require (in addition to the document itself) three-five sheets of free samples of the text typed on a specific typewriter at about the same time with the scrutinised document. Free samples of the typewritten text should be close in content to that of the document studied and typed on the same stationary.

Experimental samples shall meet the following requirements: they must be typed by a skilled typist, who would use the same ribbon colour and wear as those used to type the document.

Samples of all the characters typed at least three times before and after washing the type shall be presented for expert examination.

In some cases, one can use the typewritten text to identify the typist. In studying typing, and in subsequent practice, the typist acquires stable habits, which show in the way he or she arranges the material, numbers the pages (for instance, in top left corner, middle, or top right corner), indents, marginates, italicises, crosses out words or letters and makes corrections, divides words, strikes the letters, etc. To estimate the stability of features that characterise how the typist has mastered specific typing habits, the investigator would have to present many free and experimental samples of texts typewritten by the suspected typist, if possible on the same typewriter as the one used to type the examined document.

In addition, the investigator may have to clarify:

(a) whether some fragments of the texts were typed on the same typewriter;

(b) whether fragments of the document were typed all at once, or some of them after the document was removed from the typewriter;

(c) approximately when the document was typed;

(d) how many copies were typed in one batch.

To decide when the document was typed, the investigator shall carefully examine samples of the typewritten text typed on a given typewriter at different times. This shall be done to clarify the alteration sequence of specific features and establish the time when the typewriter possessed the totality of features reflected in the document examined.

Nowadays, they use bolt typewriters. Experimental examination of texts typed on such typewriters confirmed that it is basically possible to establish not only the typewriter model involved, but to identify the specific typewriter used.

7. Examining Printed Matter

The duplicating equipment and printing methods used to make printing matter are commonly classified into printing and operational. The former involve relief, intaglio and flat-bed printing, and the latter the mimeograph, rotaprint, electrographic machine, hectograph, and glass duplicating device.

In relief printing, the image is reproduced on paper in projecting sections. Consequently, the dye in the strokes is distributed in the centre less intensely than along the margins. The relief is markedly pronounced where the strokes are situated (especially on the back side of the sheet).

In flat-bed, the printing elements and white spaces in the matrix are virtually in the same plane, being distinguished from each other by the ability to fix the dye due to chemical treatment of the mould. The image is characterised by uniform distribution of the dying agent and by absence of relief.

In intaglio, relief printing elements are deepened in relation to the rest of the matrix surface, and are filled with printing ink, which is transferred to the paper when the latter is pressed to the mould. The dying agent, in turn, transmits the image tones and half-tones. Relief is absent.

The matrix for flat-bed and intaglio printing is made from special metal plates. A printing composition and zincographic clichés (for reproducing the text and figures, respectively) are used in relief printing.

Typesetting is normally performed by machines, and sometimes manually. Typesetting machines are classified into linotypes, which cast the type in whole lines, and monotypes, which make the line look as if it were cast with separate letters. With manual typesetting, the lines are composed of type, which includes a set of letters (characters), rulers and other white space material.

Types are distinguished by pattern, size and inclination. Pattern features involve the general shape (proportions), contrast (ratio of thickness of the main and connecting strokes), and presence or absence of cut-offs, the structural details of letters. Types similar in pattern form the font, where types are always distinguished in size (type body), incline (straight, slanted and italicised), and face width.

Nowadays, the mimeograph, rotaprint and electrograph are widely used in operative printing.

Stencils for the rotary press are made on wax paper. This is done on a typewriter either with ribbon removed, or with a special pen; the stencil being subsequently secured to a plate (or roller) covered with a uniform dye layer. The paper is pressed to the stencil, and the dye penetrates through the stencil hole. The impressions are characterised by relatively weak colour intensity, and the stroke boundaries are indistinct.

The rotaprint matrix is made of aluminium foil, on which the text is either typed on a typewriter equipped with a special ribbon, or handwritten with a special dying agent or a zincographic cliché (under a press). Then the foil is treated with chemical reagents which, when affected with the dying agent, colour only sites that bear the respective image during printing. The dying agent is spread in the same way as in flat-bed printing.

Electrography is based on the use of electrostatic properties of specific materials. In some machines, this involves selenium plates, and special paper in some xerox machines. Under light, some sites in the plates (paper) lose their electric charge during exposure. This results in a concealed electrostatic image, subsequently developed with a special powder composed of a dye-resin mixture. Then the particles are transferred onto an electrostatically-charged paper and treated with solvents or high temperatures. The dying agent possesses a characteristic lustre, and is situated in lumps not only inside the stroke, but in the form of individual disseminations over the remaining paper surface.

When inspecting the printed matter in oblique and scattered light, one can detect signs indicative of the printing technique involved by using either a magnifying glass or a microscope.

8. Examining Document Forms

Criminal investigation most frequently involves forms with names of institutions or enterprises, and normally those for compiling special documents (receipts, orders, references, diplomas, certificates, letters of credit, etc.), often made without observing the proper production process.

The following are methods most widely used by criminals to make such forms: drawing; printing with rubber type available on the market; photography; duplicators; and printing machines and processes. All these are characterised by the following features:

— *in drawn forms*, the stroke thickness is non-uniform, the same letters differ in size and shape; the pattern is non-standard; the text contains grammar mistakes and logical contradictions; the signs of pencil marks and copying through carbon paper;

— *in forms made with rubber types*, the intervals between characters, words and lines are non-uniform; the bases and apices of characters are broken; the dying agent in the strokes is arranged like in impressions made with rubber clichés; and some white spaces are printed;

— *in photographic reproductions*, the image scale does not coincide, the paper is brittle and sticky when moistened from the front side, and has an emulsion layer;

— *when using duplicators*, the text is either typed or drawn manually; also, the stroke microstructure differs;

— *when using printing machines and methods*, the resultant forms are characterised by dissimilar type patterns and sizes; by missing letters made from other characters; by use of some characters instead of others; by uneven lines; and by presence of grammar mistakes and logical contradictions.

Such documents are examined in oblique and scattered light by means of magnifying devices and measurement appliances, type catalogues, in ultraviolet and infrared rays and by means of spectrophotometry. Documents shall also be examined by X-ray-structural, X-ray-phase-and-chemical analyses to allow to determine the method used in making the form, identify the matrix, and establish to what group of materials the form belongs judging from its specific purpose, maker, paper manufacture batch.

The matrix shall be individually identified by comparing the form of the document directly with the matrix itself, or with the impressions made on it. The contents of the text, and also its arrangement, size, type pattern, and other images, as well as the specific features of the type and letter and cliché defects in both the document and experimental impression shall be examined in detail.

When an impression from the matrix is to be examined, make sure the imprint (publisher's) corresponds to that on the examined form (number of order, number of copies printed, final proof date, format, etc., usually indicated at the foot of the form). Keep in mind that small forms may be printed from one matrix which has several details similar in contents, type and arrangement simultaneously. In this case the examiner must present samples of each type of the form.

9. Examining Document Materials

Document materials include:

— *handwriting materials* in the form of strokes (on paper, fabric, plywood, etc.) and those contained in ampoules of writing devices, flasks, and so on.

— *paper* as the basis of a document, specific paper articles (signature, batch, roll, copybook, sack, etc.), particles on material objects on the scene of a crime;

— *auxiliary materials* (glue, protective covers) as component parts of a document, and also traces on other objects and measures.

Criminalistic investigation of document materials is a complex, multistage process which reveals features that reflect the specific composition and properties which allow to assign it to increasingly specific groups involving:

— a multitude of materials designed for the same purpose and of the same chemical nature class, type and brand;

— some specific source (maker, storage, use); and

— individually specific volume.

Document materials are examined by various analytical methods that allow to reveal the maximal range of identification features caused by specific recipes, production conditions, storage and use of specific materials and documents. The choice of methods would depend on the nature of the material examined, and also on its volume and properties. Forensic and technical examination of documents involves special modifications of methods and techniques used in corresponding fields of technology, study of materials and the chemistry involved in analysing materials, individual substances or their analogues with account for the criminalistic investigation in question.

To study materials containing organic substances, the investigator could use a set of methods, e. g. thin-layer and paper chromatography, electrophoresis, drop (chemical) analysis, and spectrophotometry. Qualitative analysis of fillers in paper, and cores in crayon strokes, is performed, among other things, by spectral emission analysis. Spectrophotometry in the visible range shall be used for quantitative analysis of a number of inorganic components. Electron scanning microscopy is used to estimate the fine structure of paper fibres. When studying writing materials in strokes, investigators apply light microscopy, various copying methods, and the diffusion-copying technique.

Criminalists have developed comprehensive methods for examining writing materials (ink, paste, stamp and copying dyes, electrographic toners, and crayons), and also the most frequently encountered brands of paper (stationery and newsprint), which in favourable cases allow to identify the maker of the material and the given product.

Technico-criminalistic expert examination of documents also involves the study of general-purpose black-and-white photographic paper in connection with expert examination of photographic pictures.[1] In relation to black-and-white general-purpose photographic paper, experts are to identify the group to which the paper belongs (class, genus, type, and brand); when and where it was manufactured; and whether some sheets belong to the same batch, and some scraps of paper to the same sheet.

Expert examination of general-purpose black-and-white photographic paper would involve (a) the emulsion layer and (b) the photographic substrate. The first would be to estimate spectrophotometrically the surface concentration of silver, to study the structure of the photographic image by means of scanning electron microscopy, and to specify the bleachers by chromatography with subsequent study in UV-rays. The study of metallic silver in the emulsion layer would allow to specify the type of photographic paper, and to differentiate one type of paper made by different enterprises, or at one enterprise, but by different technologies. The nature of luminescence is indicative of the type of bleacher. All this makes it easier to distinguish photographic paper and to identify its maker.

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[1] Although black-and-white photographic paper is also examined as part of forensic phototechnical expert examination, nowadays it is normally studied as part of forensic-technical expert examination of documents. This is because, first of all, forensic phototechnical expert examination is only in the making and, secondly, because many questions referred for solution to photographic paper experts, are solved with account for the principles developed for papers in general (an object of forensic-technical expert examination of documents).

In examining the photographic substrate, the investigator shall study the whiteness, intensity and colour of visible luminescence, the fibre composition, and also the sizing, bleaching and filling agents. Basing on these factors, he shall establish where and when the substrate and the photographic paper itself were made.

CHAPTER XI

CRIMINALISTIC EXAMINATION OF WRITING

1. Scientific Foundations of Forensic Study of Handwriting

Criminalistic examination of handwriting is performed to identify a person who had either written a text or executed his signature, and this makes it easier to specify the underlying circumstances of a given event and those guilty in perpetrating it.

Writing is a means for impressing and reproducing thoughts by written characters.

The ability to write is acquired through lengthy instruction and the forming of complex and stable skills caused by activity of the central nervous system. The skill of handwriting is essentially based on reflex activity.

Recurring movements result in skills (dynamic stereotypes) that significantly lower expenditure of nervous energy on various actions, including those involved in writing texts. In the course of teaching and training, writing skills become relatively stable, and writing movements automatic. As a result, the person in question develops his own handwriting.

Handwriting is a relatively stable system of movement reflected in manuscripts.

Individuality of handwriting is understood to be its uniqueness. Two persons cannot have the same system of graphic skills and movements, and this is due to a number of subjective and objective factors. All schoolchildren are first taught to reproduce initially individual parts of letters, then the letters themselves, and then words and sentences. They carefully watch all their movements, but with time writing becomes automatic. Already during training, manuscripts show various deviations from standard writing of characters, these deviations being caused by the individual's physiological, psychological and anatomic properties.

As life goes on, a person develops many unique features caused by his consciousness, will, anatomic characteristics, writing conditions, environment and other subjective and objective factors.

Relative stability of writing skills signifies that a given person had for a long time retained the individual totality of his handwriting features. Yet, even a formed handwriting could be subject to noticeable change caused by illness, fatigue, fear, alcoholic intoxication, writing conditions, and other factors. That is precisely why stability of handwriting is regarded as something relative.

Despite a variety of reasons causing changes in handwriting, the system of movements developed over a lengthy period cannot substantially change. Even if a person tries to change his handwriting intentionally to make it unrecognisable, he cannot abandon all his habits and automatic movements at once. This makes it possible to identify him by manuscripts he wrote long ago, or those involving purposely distorted hand.

2. The System of Identificational Marks Used in Examining Writing

Outer manifestation of relatively stable writing skills, as reflected in manuscripts, are commonly called *identificational marks of writing*. There are no such individual marks; in fact, a given feature may occur in the manuscripts of several persons, the only unique factor being a definite totality of marks.

Identificational marks would depend on writing skill, namely on the ability to outline one's thoughts, arrange the text, and freely coordinate one's movements in reproducing written characters. Accordingly, skills are subdivided into attributes of written speech, topographic marks, and handwriting features.

The general level of literacy, and the style and grammar differ in people and, as a rule, cannot be changed at will by the writer. That is why they are used to identify him.

Attributes of written speech reflect the writer's style, vocabulary, and literacy.

Style characterises the manner in which the writer outlines his ideas, and also his vocalubary and text structure. In texts that usually occur in investigation practice, style can be judged by the word composition and sentence structure involved.

Frequent use of the same words may indicate both insufficiently large word stock and stable habit of drawing attention to the subject matter.

In studying the sentence structure, the expert would note whether the style is laconic or verbose. He would clarify the structure of complex and compound sentences, the most frequently occurring phrases, the consistency, the use of simili, proverbs, and so on.

Lexical attributes relate to the general word stock, use of professional argot, archaisms, localisms, foreign borrowings, and slang words.

A person may possess a large or very small active and passive word stock (vocabulary), the fact offering an opportunity of identification.

Professionalisms are words, terms and notions used by some professional groups.

Archaisms are words or expressions that have become obsolete and are no longer in use by most people.

Dialectisms are words or expressions of a dialect that differ: from their counterparts in a standard language. When the writer is insufficiently literate, his speech and dialect betray him quite distinctly in his manuscripts, too.

Grammatical attributes include the general level of literacy and nature of spelling and syntax mistakes.

Handwriting attributes are subdivided into general and specific. The former characterise the system of movements as a whole, and the latter reflect specific movements in writing certain letters, their parts and connection strokes between letters.

General Attributes of Handwriting. Developed handwriting implies the degree to which the movements of a person's hand are adapted to modern cursive penmanship, or the extent to which he had mastered writing techniques. A developed handwriting is a general qualitative characteristic of penmanship. So, prior to specifying how developed a given handwriting is, one must clarify how free, cursive, and coordinated the movements are. A highly-developed handwriting is distinguished by running penmanship, coherence, free and easy movements, and regular writing habits. The notion "highly-developed handwriting" should not be mixed up with beautiful penmanship. Legible and elegant writing is an aesthetic assessment of handwriting, while well-developed penmanship shows that the writers' hand is well-adapted to cursive techniques.

Besides, handwriting is said to be highly-, medium- and little-developed. The last is characterised by uncertain and inhibited movements, which cause unstable inclination and size of letters, and also poorly coherent handwriting.

The general pattern of handwriting characterises the complexity of the manuscript's graphic structure. All beginners start with the samples of writing. But later, they deviate from them to simplify and complicate their writing movements. Depending on how they do that, highly-developed handwritings are classified into three types, viz., simple, simplified and complicated (ornate). A simple handwriting is characterised by distinct and well-proportioned letters; deviation of written letters from those shown in writing samples is either not pronounced or insignificantly pronounced. Conventionally abbreviated letters and their parts prevail in simplified handwriting. Usually, such penmanship is illegible, and different letters look alike. Also some letter elements are absent. Complicated (ornate) handwriting is noted for superfluous and unjustified (compared with writing samples) strokes, repetitions and interrupted movements.

General Form and Direction of Movement. In regard to form and direction of movements in writing letters and connecting strokes, we distinguish rounded penmanship with prevalent smooth transition from one letter element to another, and angular handwriting, in which letters and their combinations are noted for abrupt change in hand direction.

We also distinguish counter-clockwise and clockwise movements.

Coherence of handwriting manifests the ability of the writer to reproduce a definite number of letters without removing the pen or pencil when writing at normal speed. Coherence may be high, when a continuous movement is used to connect five and more letters, and medium, when three or four characters are joined by non-interrupted movement; coherence may also be poor.

Size of Handwriting (characters). This attribute is used to distinguish large-size, medium-size and small-size handwriting.

Spacing of handwriting depends on the relation between the letter width and spacing and letter height. If the letter width or spacing is equal to the height of lower-case letters, the handwriting is considered medium-spaced. If the letter width or spacing is greater than the letter height, it is regarded as sprawling; with opposite correlation, it is considered compressed.

In respect to *incline*, handwriting is classified as inclined to the right, vertically, and to the left.

Topographic attributes that reflect stable habits in arranging the text and its elements belong to common ones and essentially involve *presence, form and dimensions of margins,* which may be either both on the right- and left-hand sides, or only on one side, and be small, medium or big. The margin line may be either perpendicular to the foot of the page, slanted to the right or left, and straight, broken or winding.

Ways of identifying headings and addresses are also distinguished, and may sometimes be quite characteristic.

The direction of lines in relation to the foot of the page may be either horizontal, elevated or lowered, and the lines themselves either convex, concave or straight.

The distance between words and lines may be uniform or non-uniform, big or small.

Ways of writing dates are characterised by quite extensive variety both in form and arrangement. They may either be placed to the right or left; in the middle, corner, or at the top or bottom of the page.

If the author seeks to attract the reader's attention to some specific idea, he would apply the following techniques: indent, underline or trace certain words or sentences, write words or sentences in bolder hand, and/or underline words with dotted, continuous, or double lines. Characteristic habits also show in crossing out, correcting, adding or changing words, or in paging, and/or putting punctuation marks between words and lines.

Topographic attributes are stable and remain the same even in manuscripts written purposely in distorted handwriting.

Individual attributes of handwriting show in writing letters, their elements, and/or connections, and reflect the system of minor automatic movements typical of every person. Their qualitative characteristics depend on the pattern, direction, length, sequence, number and complexity of movements. The system of individual handwriting attributes has been developed and continues to be perfected accordingly.

A definite relationship exists between the general and individual attributes of handwriting. Change in general attributes may cause alterations in some specific ones; but most of them would still remain the same. Some individual attributes occur in various handwritings more often than others, and the identificational significance of every attribute would depend on its incidence rate.

Individual attributes are classified in accord with the characteristic movements cited above.

Pattern of Movements. In writing characters, their elements and connections, the following patterns of movements shall be distinguished: rectilinear, arch, loop, curved, oval, and angular. One form often transforms into another to make up a complex and stable system of the finest and most automatic movements.

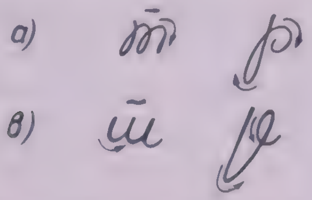
Direction of Movements. The following movements are distinguished: from bottom to top, from top to bottom, from left to right, from right to left, counter-clockwise, and clockwise. In examining a text, the expert shall try to identify any substantial deviations from those stipulated by samples of specific letters. In case he does, he would note the specific direction of movements.

Length of Movements. Some elements of a given letter may be either longer or shorter, depending on neighbouring elements of the character.

Sequence of Movements. A letter and its elements are written in definite sequence, which can also be studied by learning the system of movements inherent in the writer.

Number of Movements. Written characters may be executed in one, two or several movements, and their number in writing specific letters, letter elements and connections often proves rather typical.

Complexity of Movements. We distinguish between usual, complicated and simplified movements. Usual movements are those needed to reproduce letters in conformity with school writing samples. Complicated movements are understood to be those unjustified from the viewpoint of correct reproduction of a written character. They result in superfluous strokes and repeated and interrupted movements. Simplified movements normally occur in quick writing, when individual elements of letters are not reproduced. In this case, different letters become very similar in form, since they are executed by similar movements.



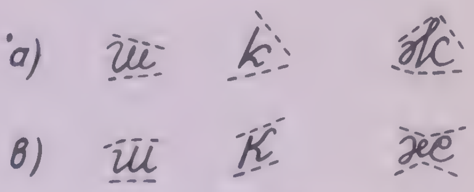


Fig. 22. Counter-clockwise and clockwise movements in writing letter elements

Fig. 23. Position of lower and upper lines in letter elements

Technique and Relative Location of Point Where Movement Begins.

Movement may begin with a preliminary stroke, loop, and even or abrupt movement; the point from where the movement would start is located either on the line, above or below it, and in relation to the letter either above or below the standard line, or in accord with writing samples.

The position of the point where strokes made by deflective and inflective movements intersect may be either high, middle, or low.

Shape and Relative Dimensions of Areas Limited by Closed Lines. Circles, ovals and other more complex closed figures differ in size, shape and position.

The Ratio Between the Bases and Tops of Letters. These lines may be horizontal, straightly rising and declining, or broken.

Position of Individual Letters and their Elements in Relation to Line and Letter Vertical Axis. Some letters and their elements may be on the line, above or below the latter, or inclined either to the right or left.

3. Technique for Examining Manuscripts

Examination of manuscripts involves the following stages: (a) study of the attributes of a given manuscript; (b) study of attributes of comparative samples; (c) comparative analysis; and (d) assessment of revealed congruities and discrepancies.

To begin with, the expert would carefully study the contents, then the attributes of written speech, topographical and general attributes of a given handwriting, and finally its individual attributes. The latter should preferably be examined in relation to the letters of the alphabet. In every letter, the expert shall trace all the individual attributes, e. g. the relative position of the starting point, direction of writing movements, and ways of connecting letter elements and endings. To identify and remember individual attributes better the expert shall reproduce them in a special table. In this case, he would depict all the versions of each letter as accurately as possible, and mark its attributes with pointers.

After analysing individual letters, he would study the ways in which letters were connected, and also record them in the table. After compiling it, he would carefully study it to select the particulars most stable and characteristic of the given hand.

Highly dissimilar features in various similar letters may be indicative of unusual conditions in which the manuscript was written. These could involve inconvenient posture, state of intoxication, low ambient temperature, and/or intentionally changed handwriting.

Intentionally changed handwriting may show in masking and imitating someone else's hand.

In masking his penmanship, the writer seeks to make his handwriting unrecognisable, and to that end resorts to one of the following techniques: he either distorts his handwriting, writes with his left hand, or imitates printing.

As a rule, simple distorion would change the most striking features. Normally, this would boil down to changing the general features, namely size, spacing and incline. Persons with well-developed handwriting would imitate poorly developed penmanship by simplifying the letter structure and/or slowing down their writing speed.

Right-handed people would write with their left hand. In that case, the incline of the letters would be unstable, the line uneven, the coherence poor, the letters distorted in shape, the connections of individual letters and their elements more angular, the strokes sometimes crooked, and some letters occasionally inverted ("reflecting").

A hand that imitates print would replace cursive forms for printed ones. In imitating another person's handwriting, the writer would try not only to conceal his own penmanship, but change it so that it would remind the expert of some specific hand. The imitator would not write, but draw with slowed-down movements.

When written characters are copied, the investigator would note occasional pauses, which the writer would need to figure out the direction of his further movements and to specify the techniques used in connecting letter elements in the original. When the imitator sees that his text contains inaccuracies, he would correct and retouch the character elements. But, unjustified stoppages and corrections are distinctly visible under a magnifying glass.

Rare features are most valuable in examining handwriting. After studying a given text, the expert would start analysing them with those in reference samples. In this case, he would also compile a table of attributes, and then compare the distinctive attributes in the manuscript with those in the samples, starting with general ones. Obvious incongruity of general attributes, which cannot be explained simply by different conditions in which a given manuscript and samples were written (for instance, by the fact that the handwriting in the samples is less developed than in the original text), indicates that the texts were written by different persons. When the manuscript under examination belongs to a highly-developed hand, and the reference samples to a poorly-developed one, this would be enough to exclude the person in question from the list of suspects.

Complexity of penmanship also belongs to these attributes. A person with simplified handwriting cannot write a text in complicated penmanship.

Yet, one cannot always make a negative conclusion merely basing on incongruence of general attributes. Consequently, there would also be need to continue the comparison of individual attributes.

In contrasting individual handwriting features, account shall be taken of where a written character containing a given attribute is situated (in the beginning, middle or end of the word), and also what letter precedes that character and what character follows it to affect the attribute in question. In comparing individual features, attention shall be given not only to congruent but also to discrepant features. In this case, the expert would take into consideration that certain distinctions in individual features are also observed in manuscripts written by the same person; but, these are minor discrepancies in letters and their elements, not in the structure of automatic movements.

In the final analysis, the expert, proceeding from the nature and number of congruent and discrepant features, and basing on his personal experience, would decide whether the texts are identical.

The method for investigating signatures is basically the same as that used in examining texts. But signatures are harder to trace.

Over the last years, Soviet criminalists have conducted fruitful research to expand criminalistic investigation of handwriting. Among other things, they developed a technique for determining whether a text was written by a male or female to make it much easier to identify the writer of an anonymous text.

The theories of probability and mathematical statistics have allowed to count the incidence rate of various handwriting attributes with respect to sex. The import of every attribute was expressed in the form of a factor, and during the investigation the factors of the revealed attributes were used in a mathematical calculation involving a special formula.

Much work was also done to determine the incidence rates of various features that show in Russian cursive handwriting. When we have quantitative values that correspond to the incidence of the totality of features revealed in the text, we can perform a simple calculation to determine the incidence rate of that totality. Work designed to perfect the probability-statistical method for investigating manuscripts is still going on.

4. Preparations for Criminalistic Expert Examination of Handwriting

In preparing materials for criminalistic examination of handwriting, the investigator's principal task is to submit to the examiner sound reference samples, including free and experimental ones.

Free samples are those that are executed prior to instituting criminal proceedings. Forensic and expert examination give them major significance, since reference materials are written in conditions excluding intentionally distorted handwriting.

Several documents shall be forwarded as free samples, since only one (irrespective of its size) would make it hard to judge of a person's penmanship.

It is important for free samples to maximally correspond to the original text in purpose and dating.

Comparison of turns of speech, similar sentences and words would allow to reveal more features and enhance their identificational significance.

Manuscripts written by the same person with different purpose may widely vary. Rough notes are normally written carelessly, i. e. in simplified and abbreviated style. Conversely, official documents are executed more meticulously.

Depending on conditions of work and other reasons, intensive practice in penmanship would make it more developed. Conversely, it could degrade on account of serious illness, old age, and so on. Free samples should therefore date back to the same time as the original documents. Conventionally-free samples are normally understood to be texts and signatures executed after institution of criminal proceedings, but not for expert examination of complaints, applications, etc.

Experimental manuscripts are those written at the suggestion of the investigator, judge or procurator specifically for comparative examination. They are either dictated or written independently by the suspect at the suggestion of the investigator or judge, and always in their presence. The best thing to do is to dictate the text to be examined. If this cannot be done because of the content, the investigator shall prepare in advance a text that would include the words of the document under study, but in different combinations.

In preparing the reference material, the investigator shall keep in mind the general rule that the shorter the text to be examined, the more samples would be needed. If it was written with the left hand, or imitating print, or in distorted handwriting, the investigator would have to send for expert examination free and experimental samples with normal cursive handwriting, and also experimental samples obtained in conformity with the specific penmanship of the document to be examined (the investigator would take samples written with the left hand, those imitating print, those executed in some unusual posture, etc.). When taking them, he shall not tell the suspect to write in some specific style, i. e. in big or small letters, or compactly and by reproducing the letter structure and/or their elements in accord with the original.

Before deciding whether a signature was made by some specific person, the investigator must have the following samples:

(a) free and experimental samples of the signature of the person in whose name it was executed. This would allow to establish whether the fraudulent signatory tried to imitate genuine signatures, or had made them arbitrarily, without actually knowing the true signature;

(b) free samples written by the suspect in the form of texts;

(c) free samples of the suspect's signatures;

(d) experimental samples written by the suspect in the form of the surname of the person whose signature is listed.

Experimental signature samples shall be obtained on several sheets of paper after certain time intervals.

Free and experimental samples shall be certified by the investigator or judge. If there is ground to assume that the signature to be examined has been made in unusual conditions, it would be advisable to invite a specialist so that reference samples could be obtained.

CHAPTER XII

IDENTIFICATION OF AN INDIVIDUAL BY EXTERNAL FEATURES

1. Classification of External Features

In the process of investigating a crime there often arises the need for identifying an individual by his external appearance.

In the 1880s a French criminologist by the name of A. Bertillon devised a special method of describing an individual's external features which he called a "verbal portrait". Subsequently, external features began to be used in photo-identification examination as well.

As is well known, external features are numerous and varied and often have differing names. In order to use these features in successfully identifying an individual, it is essential to classify them and to maintain a consistent system of terms.

External features are divided into two major groups. Those features which describe the anatomical structure of an individual are commonly referred to as *anatomical* or *static* features. Features which are physiologically based on conditional reflexes and are accompanied by an appearance of a dynamic stereotype constitute a separate group. That group is composed of habitual, automatic movements and postures of the body as a whole, as well as of its individual parts (walk, carriage, gesticulation, mimicry, etc.). The features which are included in this group have received the designation of *functional* or *dynamic* external features.

In the methodology of verbal portrait not only the normal variations of external features have an important significance, but their pathological forms (anatomical and functional anomalies) as well. The latter are grouped separately as "particular features". Yet another, separate group is formed on the basis of the so-called "distinct features"; that is, those relatively rare, vividly expressed and easily remembered features which play an important role in a search. An auxiliary group is formed from those features pertaining to clothing and other personal items. As additional information to physical characteristics, they can have a vital significance for identification.

The methodology of verbal portrait provides for the description of anatomical features with indications as to their size, form, placement and, in some cases, their colour.

The size of a given body part is determined, as a rule, by visual comparison with the size of other parts. For example, the height of the forehead is determined by comparing it to the height of the nasal or oral segments of the face. The length of the arm is measured in relation to the individual's overall height. Size description uses a three-, five- or seven-unit scale. For example, a three-unit scale for the height of a forehead includes the following gradations: low, medium and high. If we add the gradations "very low" and "very high" we have, as a result, a five-unit scale. And when we add two more gradations ("low to medium" and "medium to high"), we have a seven-unit scale. The use of one or another of these scales is determined in each specific instance by the purpose of the description: purely investigative work uses, most frequently, the three-unit scale as it is the least complex, but expert examination prefers the five- or seven-unit scale because of its exactness. In photographic identification, experts determine the size comparisons of facial features in absolute numerical terms.

The form (contour) of body parts is described using the terminology of geometric figures and lines (triangular, oval, straight, convex, sinuous, and so forth).

The placement of body parts is fixed according to horizontal or vertical surfaces, or in relation to neighbouring parts.

Colour is indicated for hair, eyes, facial skin, birthmarks, scars, tatoos, and other particular features. Facial features are described in two manners: front to back (full-face) and from the side (in profile, as a rule, from the right). Description (from both sides) in two profiles is recommended only in the case of a discrepancy.

Anatomical (Static) Features

Sex and Age. When valid evidence is lacking, age is indicated approximately ("approximately 40 to 45 years of age").

Height. Height is determined, as a rule, according to a three-unit scale: short (males to 160 cm), medium (160-174 cm) and tall (more than 174 cm). For females, these limits are decreased by 5-10 cm.

General Body Build. Distinctions are made for individuals with strong, medium and weak builds. In terms of fat content, individuals are divided into groups of slender, normal and stout builds, as well as slight and obese builds.

The Head. Head-size is determined in comparison to general body build and the form of the back of the head as viewed in profile (vertical, slanted, protruding).

Hair. Hair is described in terms of its thickness, shape, the contour of the hairline, colour, the presence and degree of greying, the degree and location of balding, length, style and type of cut, and indications of artificial colouring. In terms of mustaches, beards and sideburns, their length, shape and colour are indicated.

The Face. The overall shape of the face is described (full-face or frontal view): round, oval, etc., as well as the general contours in profile: convex, straight, concave. The degree of fullness and colouring is also indicated.

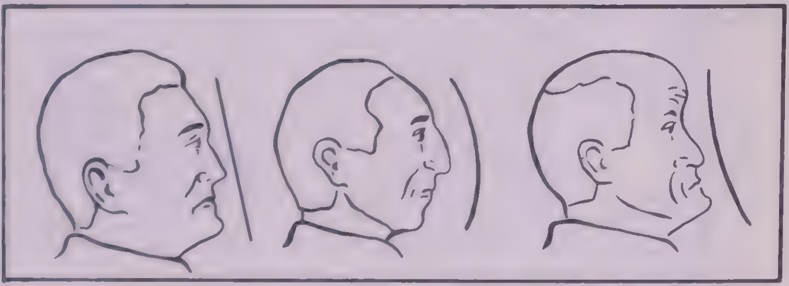


Fig. 24. Contours of the profile (straight, convex, concave)

The Forehead. The forehead is characterised in profile in terms of its height, placement and contour (slanted, vertical, protruding). Any significant projection of the brow and the presence of frontal tubers is also indicated. The width of the forehead is indicated in full-face.

The Brows. The brows are characterised by length, width, thickness, placement (angled inward or outward, horizontal), form and by mutual comparison.

The Eyes. The eyes are described in terms of size, form, type of slit, degree of protuberance of the eyeball and colour. Variegated colour is noted, as is any "milky border" or specks on the iris. Cross-eyes, the presence of cataracts, glass eyes, and other anomalies are also noted.

The Nose. The height and width of the nose is indicated, as well as the length of the ridge of the nose, the depth of the bridge, the degree of protuberance, the contour of the nose in profile, the width and form of the nose in full-face view, position of the base of the nose in profile, position and form of the tip of the nose and form of the wings of the nostrils.

The Lips. The lips are characterised according to thickness, protuberance and height of the upper lip. In the case of missing front teeth, a slight sunkness of the lips may be noted. The presence of any elevation of the upper lip or a sagging of the lower lip is noted, as is any cleft in the lips.

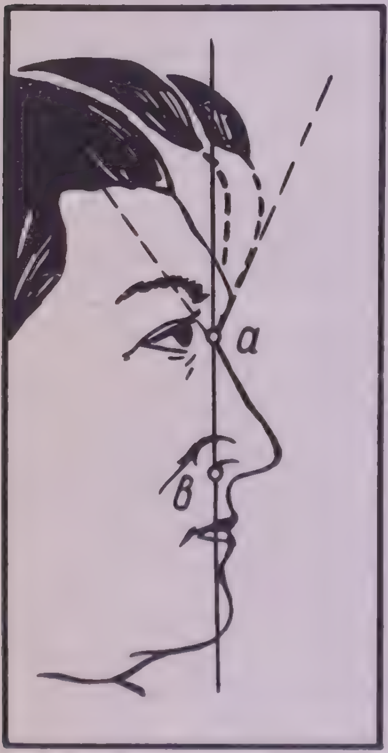


Fig. 25. Definition of slanted and protruding foreheads

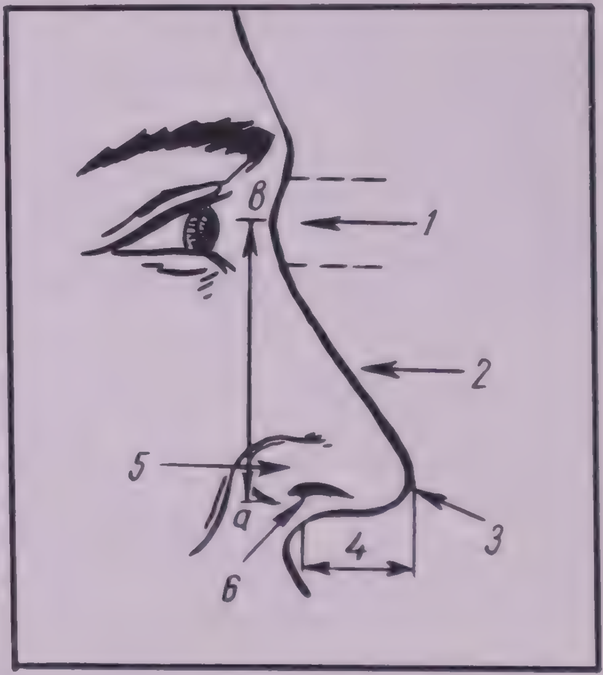


Fig. 26. Parts of the nose:

1. bridge; 2. ridge of the nose; 3. tip of the nose; 4. base of the nose; 5. wings of the nostrils; 6. nostrils; line ab — height of the nose

The Mouth. The mouth is characterised in full-face as to its size and the positioning of its corners (horizontal, slightly elevated, lowered).

The Teeth. The teeth are described by size, form, specifics of placement and colour. The absence of, or damage to individual teeth is noted, as well as the presence of fillings and false teeth (it is important to note the colour of metal used for the plates).

The Chin. The chin is characterised by height (in profile), the distance from the edge of the lower lip to the tip of the chin, the width (described in full-face), the slope (in profile) and form of the lower edge of the chin (in full-face).

The Ear. In profile, the size and form (oval, round, right-angled, triangular) of the concha is indicated, as well as its position (vertical, slanted) and peculiarities in the shape of the lobe, the antitragus, the helix (whorl) and the anthelix.

In addition, the ear is characterised in full-face by the degree of contiguity (or protuberance).

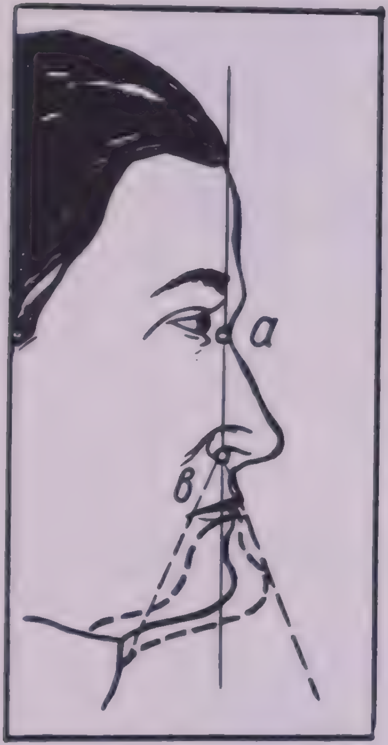


Fig. 27. Definition of slanted and protruding chin

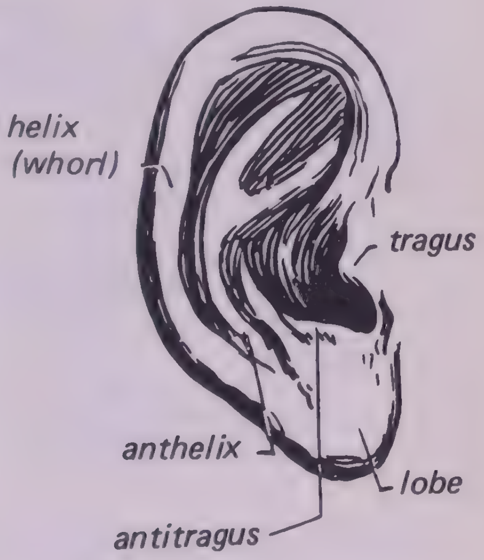


Fig. 28. Parts of the concha

The variety and stability of the anatomical peculiarities of the concha give it significant importance in the process of identification.

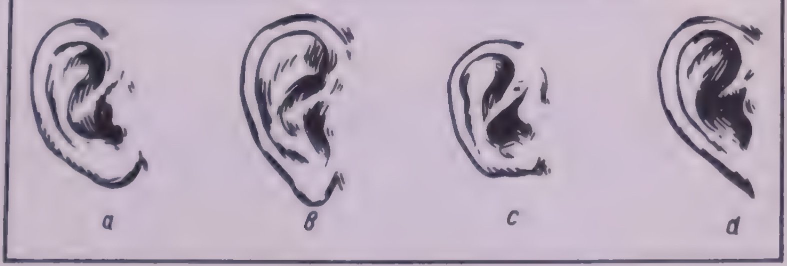


Fig. 29. Contours of the free edge of the earlobe:

a — rounded; b — triangular; c — horizontal-straight;
d — slanted-straight

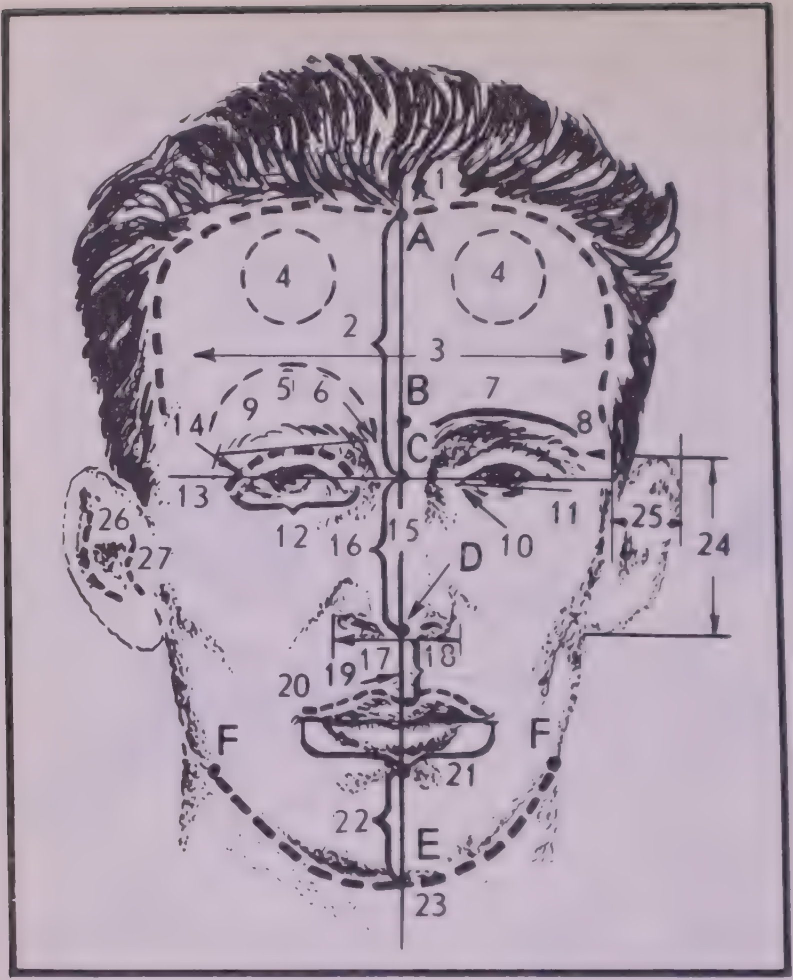


Fig. 30. Facial features (full-face):

1. hairline; 2. height of the forehead; 3. width of the forehead; 4. areas of the frontal tubers; 5. area of the right eyebrow; 6. tip of the eyebrow; 7. curve of the eyebrow; 8. tail of the eyebrow; 9. line of placement of the brow; 10. interior corner of the eye; 11. line of placement of eye slit; 12. length of the eye slit; 13. pupil line; 14. curve of the fold of the upper eyelid; 15. width of the ridge of the nose; 16. height of the nose (nasal segment of the face); 17. width of the nose; 18. height of the upper lip; 19. filter; 20. curve of the edge of the upper lip; 21. length of the oral cavity; 22. height of the chin; 23. curve of the chin; 24. height of the concha; 25. protuberance of the concha; 26. curve of the anthelix; 27. curve of the tragus. A — upper forehead point; B — glabella; C — upper nose point; D — lower nose point; E — chin point; F — lower jawline point

Wrinkles. When wrinkles are observed in an individual in normal (in accordance with age) morphological variations, their identifying capabilities are rather insignificant. All the same, if an inordinately large quantity of wrinkles are noted on the face of a young individual, or if, on the other hand, they are almost completely absent on the face of an older individual, or draw attention to themselves by their sharp distinctiveness

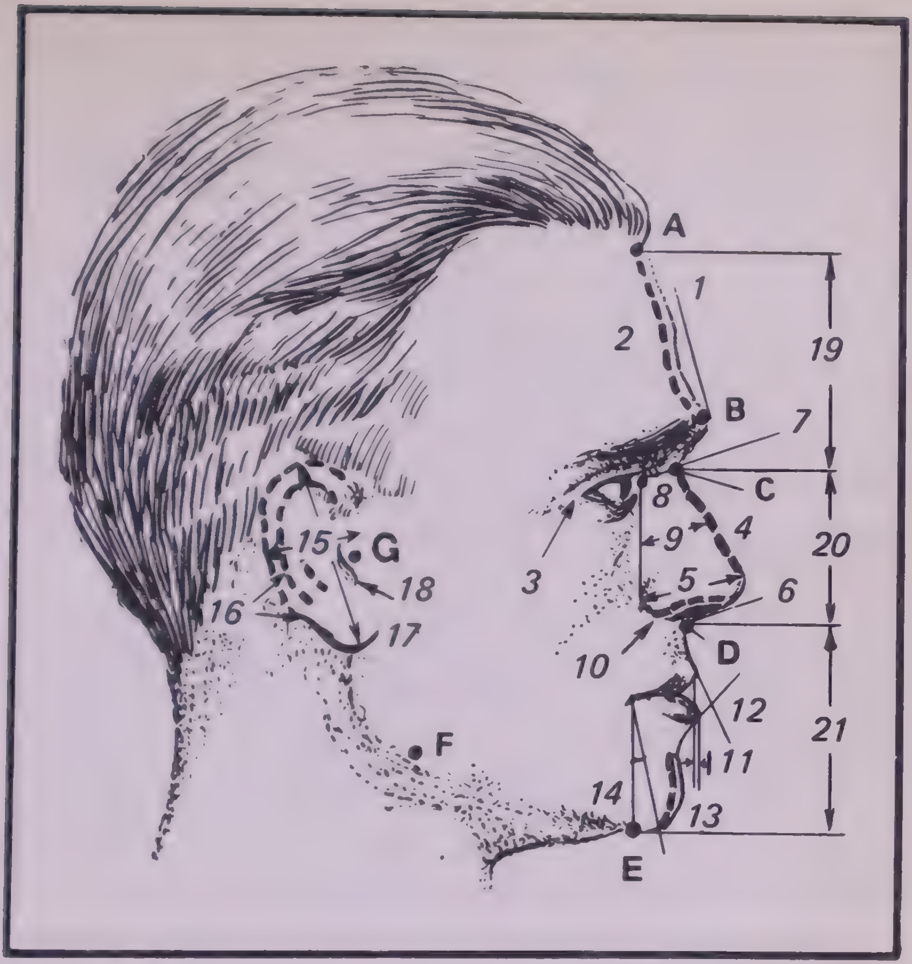


Fig. 31. Facial features (in profile):

1. angle of the forehead; 2. curve of the forehead; 3. exterior corner of the eye; 4. curve of the ridge of the nose; 5. projection of the tip of the nose; 6. line of placement of the base of the nose; 7/8. measurement of the depth and height of the bridge of the nose; 9. projection of the ridge of the nose; 10. curve of the edge of the wing of the nostril; 11/12. relative placement of the lips; 13. curve of the chin; 14. placement of the chin; 15. width of the concha; 16. outer and inner curves of the helix (whorl); 17. curve of the edge of earlobe; 18. curve of the antitragus; 19, 20, 21. forehead, nasal and oral segments of the face and their heights. A, B, C, D, E, F, G: Anthropometric facial points (upper forehead, glabella, upper nose, lower nose, chin, lower jawline and point of the tragus)

or peculiarities of location, then these features acquire a greater identifying significance. In terms of their location, wrinkles are divided into the following groups: those on the forehead, between the brows, on the temples, on the tragus, between the nose and the upper lip, oral (around the mouth), on the cheeks, and on the neck. In describing these wrinkles, it is important to indicate their position, quantity, degree of expressivity, form and direction.

The Neck. The neck is characterised in terms of its length and thickness; any significant protuberance of the Adam's apple should be noted.

The Shoulders. The shoulders are described in terms of their width and slope (dropped downwards, straight, horizontal, raised, one shoulder higher than the other).

The Chest. The chest is characterised in terms of its width, its prominence (sunken or protruding) and the degree of development of the chest muscles (the fullness of the chest).

The Back. The contour of the back may be straight (a flat back), with minor curves in the neck, chest and waist areas (a normal posture for the body), or with distortions in the area of the cervical vertebrae (stooping). Any significant projection of the shoulder blades should be noted, as well as any pathological deformity of the spinal column.

The Extremities. The extremities are characterised in terms of their length and thickness. A description of the hands includes: their length and width, the indication of the presence of hair on the back of the hands, the length and thickness of the fingers, the absence of any individual fingers or their phalanxes, deformities and contractures (inflexibility or curvature) of the fingers, thickening of the joints, size and form of the nails, the presence of job-related calluses and indications of any cuts.

Functional (Dynamic) Features

Carriage. Carriage, i. e., the usual posture of the torso, head and arms, may vary from individual to individual. The torso, in terms of its posture, may be tense, tight, free or relaxed. Carriage also refers to the usual position of the head: it may be held straight, tilted back, stretched forward or tipped to the right or left. The position of the hands and arms is also indicated in a description of carriage: some are more inclined to keep their hands in their pockets, others prefer to hold them at their lapels, on their hips, along the sides of their bodies, behind their backs, on their chests, etc.

Gait. Gait expresses the peculiarities of stereotyped body movements while walking and may be slow, quick, light, heavy, firm, stumbling, waddling, springy, with large or small steps, having a large or small turn of the foot, with or without a sweeping gesticulation of the arms. In the event of limping, it is important to indicate the afflicted leg, and the degree of lameness as well. It should also be noted as to whether or not the individual uses a stick, a cane or crutches.

Gesticulation. Gesticulation represents the entire complex of gestures which accompany spoken speech. In the main it is characterised by the movements of the hands which are used to intensify the expressivity of speech, or the habitual movements of the head or entire torso that an individual makes during conversation. It may also refer to the shrugging of shoulders and other similar gestures witnessed during conversation.

Mimicry. Mimicry, or the usual muscular movements of the face may be either highly developed or relatively inexpressive. In verbal portrait concrete descriptions of these peculiarities are given: for example, knitting the brows, wrinkling the forehead, biting the lips, pursing the mouth, squinting, looking out from under the brows, etc.

The Voice. The voice is distinguished by pitch, timbre, strength and clarity.

Speech. In description of speech, the following specifics are noted: slowness, quickness, calmness, agitation, brokenness, distinctiveness or indistinctiveness, presence of speech defects (burring, stuttering, lisping, thick speech), the presence of an identifiable accent or dialect, intonation, any phraseological and lexical peculiarities.

Ways of Performing Specific Actions. Numerous and varied stereotyped peculiarities of performing one or another action belong to this group of functional features. Among these are: the manner in which one lights a cigarette, holding and extinguishing cigarettes, greeting another individual, combing one's hair, laughing and expressing delight.

These external features also have a certain significance for identification and it is unwise to ignore them in the process of investigation. The formation of a stereotype of usual movements for a given individual is, as a rule, a stable complex for identification which will allow an almost faultless method for establishing an individual's identity. But, contrary to anatomical features which are characterised by a high degree of stability, functional features may be easily modified, not only at the moment of their perception (for example, while leaving the scene of a crime, the criminal might fake a limp or change his voice, etc.), but also later, during identification.

Particular Features and *Distinct Features.* "Particular features" are those various anatomical and functional anomalies which are distinguished by their relative rarity and extreme stability.

To this group belong such things as non-conformity in the size of various body parts, colour anomalies, tumours or growths, scars and other acutely expressive departures from the normal anatomical structure of the body such as a stunt, an atrophy or contracture of the extremities, a curvature of the spine, a hump, cicatrices, birthmarks, warts, smallpox scars, persistent tumours and calluses, unusual pigmentation, work-related discolouration of any skin areas, chronic skin diseases and tattoos.

Functional "particular features" are acute deviations from the normal posture and movements of individual body parts: limping, swinging only one arm while walking, nervous tics, clearly audible speech defects such as stuttering, and other such features.

"Distinctive features" may be both anatomical and functional in origin. To this group belong those functional features which are highly expressive and easily recalled (for example: an unusual way of swinging one's arms while walking) as well as those distinctive anatomical features which are located on exposed parts of the body (a cleft in the lip, an extremely large nose, etc.).

"Particular features" and "distinctive features" are described in detail as to their placement, degree of expressivity, dimensions, form, direction, and, in some instances, in terms of their superficial characteristics and colour.

When describing tattoos, it is imperative to indicate the subject depicted, inscriptions, initials and other peculiarities.

Clothing and Personal Items. Clothing, shoes, rings, bracelets, necklaces, earrings, wrist- and pocket-watches, cigarette-holders, lighters, and similar articles are inconstant objects which are easily exchanged and therefore their significance in identification depends on whether or not they remained intact on the individual up to the moment of identification. Personal items acquire an importance when, under unfavourable conditions of observation, they may be perceived and remembered better than anatomical external features when "distinctive features" are lacking.

Clothing and other personal items should be described in as much detail as possible, especially when examining an unidentified corpse.

2. The Use of a Verbal Portrait in Search and Investigation

The verbal portrait methodology is widely used in search and investigation, as well as in expert practice. It is used, in the main, as a means of identification and criminal registration.

The verbal portrait aids the investigator and his assistants in their search for, observation of, and arrest of escaped criminals, in their search for missing persons, in identifying corpses and in determining the identity of suspects, accused individuals, witnesses and victims.

In searching for escaped criminals and missing persons, verbal portrait is used in preparing investigative orders, in which a detailed description of the individual in question is given, along with a description of any "particular features" or "distinctive features". All of this aids the authorities conducting the search to compile and maintain a mental image of the individual in question.

Keeping in mind that there are external features important for the search process which can easily be changed (for example, the presence of a mustache or beard, clothing, shoes, etc.), search measures using verbal portrait must be conducted quickly and effectively. Sources of information as to external features of the individual in question may be any or all of the following: data from criminal records, police, as well as personal file material, photographs, information gained during questioning, personal observation and examination of the scene of the crime.

The verbal portrait of an escaped criminal whose identity has not yet been established is formed, as a rule, from the evidence given by the victim and any eyewitnesses, as well as from the evidence gathered during the analysis of the circumstances under which the crime was perpetrated. Often, analysis of tracks and other real evidence uncovered on the scene will give information as to the appearance of the criminal. In terms of such evidence, the most important items are footprints, fingerprints, teeth marks, marks left by the tools used in a forcible entry, and various other traces and objects. This information enables the investigator to speculate as to the criminal's height, sex, build and any physical deformities he might have. For example, by studying fingerprints and their location, one may determine an approximate height of the criminal. And by studying the size of the opening through which he made his entry onto the scene of the crime, one may approximate his body build.

In registering unidentified corpses and missing persons, external features are described in as much detail as possible on registration card specifically designated for identification purposes (for more detail on such cards, see Chapter XIII).

In registering individuals under arrest, external features are described using the system of verbal portrait. A verbal description together with identifying photographs is a significant addition to an alphabetical listing of individuals who have committed crimes (see Chapter XIII).

The methodology of verbal portrait determines, to a great degree, the parameters of signal (or identifying) photographs. The portrait photographs in full-face and in profile are designed to coordinate with the system of verbal portrait in establishing the identity of an individual. It also renders possible a comparison of those features visible in the photograph with those described in the verbal portrait.

Verbal portrait is also used in developing and later in applying the *method of compound portraiture*, so-called "*photo-robots*", "*isorobots*". As is well known, it is easier for the witness to reproduce those features he noted on the suspect if he is helped in this by the addition of another, simpler form of reproduction, namely, recognition. If the witness is shown a photograph (or drawing) which reproduces several variations of one and the same facial feature, then, as a rule, he will undoubtedly indicate that variation which most closely approximates the external features of the suspect under investigation. This psychological conformity in conjunction with the method of verbal portrait is what forms the basis of "compound portraits".

In order to form a picture of the face seen by the witness, victim or suspect, and described by him, the individual under interrogation is shown photographs or drawings which depict basic variations in the structure of the head, forehead, eyes, nose, lips, chin, ears, neck, shoulders, etc. The individual under interrogation then chooses the variation which most closely approximates the features of the individual being sought. The same is done for headwear, glasses, cigarette-holders, neckties and other objects. Pictures of these objects in several variations are also offered. When the selection of photographs and drawings showing various body parts and personal items is complete, a montage of the details is made in order to create a compound portrait of the suspect. After the montage is ready, it is shown once again to the individual under interrogation and all corrections are made in accordance with his remarks. The finished composite portrait is then reproduced and sent to all involved organisations for use in their search for the criminal.

During the interrogation to establish the external features of a given suspect, the method of verbal portrait gives the authorities the most specific and detailed description possible.

It is usual for the witness to give a superficial description of the suspect even in those instances where the witness saw him on more than one occasion. Under such circumstances, the height, general body build, hair colour and various individual details in clothing, and some other distinctive features are what are most commonly remembered. The investigator, using verbal portrait, can help the witness describe the suspect in as much detail as possible. It can also aid in dividing the entire mental picture of the suspect into its component parts, singling out the most peculiar characteristics, specifying and detailing various individual features. It is important to keep in mind that, in such instances, leading questions are dangerous. Recalling the psychological laws of perception and memory which are activated by associative processes, it is essential to aid the witness in giving a detailed description of the external features by posing additional specific questions. In doing so, it is advisable to keep to the terminology of verbal portrait. But if the witness is unfamiliar with that terminology and uses different designations for individual features, these must be recorded intact in the description as substitution of specialised terminology may lead to a significant distortion.

Verbal portrait may also be used *during examination*. When describing any physical injuries, marks on the skin or other anatomical features which have been uncovered in the process of examination, the terminology of verbal portrait is used and their specific location, size, form, and where necessary, colour is indicated.

The methodology of verbal portrait is widely used in identification expertise as well.

3. Ways of Identifying an Individual by External Features

The use of anatomical and functional external features in the identification process is conditioned first and foremost by their stability, defined by the relative permanency of the osseo-cartilaginous base of the human body. Changes due to age or illness of the anatomical features have no significant practical importance as, in the first place, age-related changes occur quite slowly and, in the parameters of the identification period, lead to no qualitative differences. In the second place, illness-related (traumatic) changes have relevance for just a few features, and therefore, the optimal sum total of external features of a given individual remains unique and non-repeatable. Deliberate changes in anatomical features with the help of plastic surgery leave traces which are easily detected during examination.

Functional features in this way are less reliable, in that they may be deliberately changed. For example, if there is desire and sufficient self-control, an individual may change his walk and rid himself of a habitual gesticulation, if only temporarily. All the same, no one may significantly change the sum total of one's external features. Therefore, the complex of functional features belonging to one or another individual remains relatively stable and unique. Their stability is owing to the systematic functioning of the major cerebral hemispheres and the creation of dynamic stereotypes (a stable system of conditioned reflexes) in the performance of certain actions (while walking, in conversation, etc.). The more complex the system of actions, the slower an individual is able to assimilate it, and the longer it takes to form one or another dynamic stereotype. But once formed, it becomes stable and difficult to subordinate to the influence of the individual's will. These psycho-physiological peculiarities must be taken into account when assessing the stable nature of one or another functional external feature of man.

The authenticity of an identification based on both functional and anatomical external features depends in large part on whether or not they are taken isolatedly or in the aggregate. In the latter case, the reliability of the conclusions drawn is greatly enhanced.

Identification of an individual according to his external features using the methodology of verbal portrait is divided into several types.

Identification of an Individual by Presenting Him for Recognition. This practice is most common in both investigative and judicial practice. Living individuals, corpses, or photographs of the same may be presented for recognition. Identification is made on the basis of the mental image fixed in the memory of the individual charged with making the identification (see Chapter XXI).

Identification of an Individual by Means of Direct Comparison with a Photograph or Artist's Sketch. This type of recognition is used when verifying the identity of a witness, victim, expert, suspect or accused called in for questioning. It is done by comparing the external features of the individual in question with those in the photograph contained in the document which establishes the individual's identity. In addition, it is used during search operations when the officer conducting the search compares the features of the person being sought (as indicated in his photograph or compound portrait) with those of a similar individual.

When comparing these features it is imperative to use the terminology of verbal portrait in order to maintain consistency and to give as detailed a comparison as possible. The use of consistent terminology will also allow attention to be paid not only to general resemblances, but to the coincidence of features compared individually.

Identification of an Individual by Means of Direct Comparison of His External Appearance with a Verbal Portrait. If no photograph of the missing person is available, the officer conducting the search must compose a portrait of the individual in question on the basis of external features as described in eyewitness accounts. Under such conditions the demands of verbal portrait are particularly important as a nonsystematic description in general, and especially when no photograph is available, seriously hampers the identification of the missing person.

Identification of an Individual by Comparing a Verbal Portrait with a Photograph. In the course of the search process, a verbal portrait of the missing person is often compared with photographs of the suspects.

In those cases when no photograph is available, *identification may be made on the basis of a comparison between two verbal descriptions.* The authenticity of the results obtained through such a process depends in large part on the accuracy and fullness of the description obtained through use of the methodology of verbal portrait.

In investigative and search practice, the need often arises *for establishing identity by using the skull* (the so-called "sculptural reconstruction method"). This method, developed by Professor M. M. Gerasimov, a Soviet anthropologist, consists in covering the skull with a layer of wax, the thickness of which is determined by data as to the thickness of the soft facial coverings and their functional connections with the skeleton. The sculptural portrait thus created is then compared to a photograph of the missing person taken while alive, or to a verbal portrait of the same. Such a sculptural portrait may not serve as the basis for expert examination; it is used only in search practice and is shown to relatives and friends of the missing person.

Expert Identification of an Individual Using Photographs (Photographic Identification Expert Examination). See the following section.

4. Fundamentals of Photographic Identification Expert Examination

In comparison to the above-named types of identification of an individual on the basis of external features, this type has its own specifics which are apparent not only in its methodology, but in the objects of its investigations.

The object of investigation of photographic identification is, in all cases, a specific individual whose identity is to be established. The items used in the identification process may be: geometrically exact (reduced, life-size or enlarged) images of the head and face of the individual; the skull or a photograph of the same. Such images can be: photographic portraits (photographs, still photos from a movie, holographic images) and X-rays of the skull. Painted portraits, plastic reconstructions of the face based on the skull and death masks (moulds) are not satisfying as geometrically accurate copies and therefore cannot be objects of photographic identification expert examination.

With the help of photographic identification it is possible to determine whether just one individual or different individuals are pictured in given photos, and whether or not the individual being sought is the one in the photographs; in addition, it may be determined whether or not the skull of the deceased person is that of the individual being sought (for example, a missing person). These objectives are accomplished in practice by an expert by comparing: a) identifying (signal) and other portrait photographs of a corpse with the photo-portrait of a missing person; b) the portrait photograph of an escaped criminal (an individual being sought) with the expertly done photo-portrait of the suspect, or with photographs from documents identifying his person, or with photographs obtained from his relatives, acquaintances or through search warrants; c) portrait photographs of a missing person with those of an escaped criminal; d) portrait photographs from various documents made out for various individuals, if the question arises as to whether or not the items are forgeries and have been supplied with pictures of one and the same individual; e) two or more portrait photographs of a single criminal suspect who is being sought (or a missing person) which have been obtained from various sources, when it is imperative to establish, without a doubt, whether the various photos are of one and the same individual; f) X-rays taken while a missing person or escaped criminal was still alive with the photograph of a skull belonging to an unidentified individual; g) the photo-portrait of a missing person or escaped criminal with head X-rays of a corpse whose identity is impossible to establish due to decomposition or disfigurement by the criminal.

Of those external features listed in Section 1, expert identification uses only anatomical features, specifically those pertaining to the shape of the head and face. Typical morphological variations of facial features, head shape and sometimes that of the neck, shoulders, chest and extremities are those common identifying features used in photographic identification.

Specific anatomical features are those which deal with the particulars (size, form, placement) of anatomical anomalies ("particular features") such as scars, birthmarks, warts, smallpox scars and other facial skin diseases, pigmentation, acute anatomical disproportions, as well as peculiarities of placement of topographical-anatomical points on the face and proportional (straight and angular) relations between them. Experts usually utilise twelve to fourteen different such points both in full-face and in profile. Some examples are the points which correspond to the outer and inner corners of the eyes and lips, the pupils and the tip of the nose, the point of the bridge of the nose and the base of the nose, the point where the earlobe is attached to the head, and others. When quality photographs are available and when other conditions concerning the preparation of the identifying objects and comparative objects are met, the expert is able to draw, on the basis of the sum total of general and specific features, concrete conclusions as to whether just one, or more than one individual is pictured in two or more portrait photographs.

The success of such identification procedure depends to a great extent on the quality of objects used in the process of identification. These objects (portrait photographs, X-rays of an escaped criminal or missing person, the skull of a corpse) must be presented to the expert, as a rule, in exactly the condition in which they were found, or turned over to the investigator.

In some situations, when necessary, the expert prepares the objects for examination by conducting photochemical enhancement or weakening of photographs; by erasing, or washing off streaks of dye which hamper identification; or by enhancing the contrast in the photos. He may also make exact-scale photocopies in which the person in question is shown in comparative images; he may piece together torn photos and make a reproduction from the photo; and he may make prints from the negatives which have been turned over to him.

In order to make the examination easier and more productive, it follows that the investigator should give to the expert only those photos (as a basis for comparison) which are the most analogous to the object under examination in terms of pose and date of photographing. He should take measures to obtain more than one portrait photograph of the individual, each showing a different pose and unretouched. If the negatives are available, it is advisable to send them over, together with the prints, to the expert.

Photographic identification and examination are done, in certain instances, by comparing similar-scale photographs which have been prepared in such a way that the distance between the static topographical-anatomical points in each (for example, that between the tip of the nose or the tragus and the outer corner of the eye) is identical.

Before comparing linear and angular sizes of same-scale images of a given feature during separate stages of the examination of photographs, it is advisable to determine whether or not the poses are identical.

The expert must take into account changes in the identification points of the external features, depending on the difference in poses, as well as on the varied conditions of lighting when photographs were taken.

In practice, experts in photo-portrait identification use the following methods of comparative examination.

Visual Method. The visual method is the most widespread traditional method of photographic identification used in examination of both single-pose and multi-pose photo-portraits. Obvious qualitative peculiarities of form, as well as size relationships, placement and coordination of features, are visually compared as they are depicted in the available photographs. For better clarity, various notations are made on the photo-reproductions. The visual evaluation of features is not free from the influence of subjective factors. Identification is particularly difficult when there are no particular features, as the use of the visual method does not include qualitative characteristics of features. Instead, the identification significance of such indicators as form, size and placement, even using a five- or seven-unit scale, is minor. Therefore, the need arises for a method of measurement.

Method of Linear and Angular Measurement. The method of linear and angular measurement is used when examining portrait photographs where the poses are fixed. The essence of such a method is as follows: on same-scale photo-reproductions of portrait photographs under expert examination, a number of clearly defined, relatively static topographical-anatomical (anthropometric) points are indicated and with the aid of measuring instruments (compass, ruler, special circular protractors), the distances between these points are determined. In addition, the measurements of the angles formed by the intersections of various combinations of lines joining these points are also indicated. In this way, the numerical indicators of the relations between the various segments and angles are obvious and can then be compared. When there is an equality of the corresponding proportions of features under examination, it is possible to give a positive answer to the question of whether or not the photographs are of the same individual. The absence of such an equality is, of course, the basis for a negative answer to this question.

When choosing the topographical-anatomical points, it is advisable to concentrate on those which have not been subject to distortion in the process of photographing. It is important to evaluate the results of such measurements quite cautiously, since even a minor discrepancy in the poses or in other conditions of the photographic process may lead to a significant divergence between the linear, and even more so, the angular measurements, of the photographs under examination.

In practice, when identifying an individual on the basis of external features, it is rare that portrait photographs will be available which have been done under absolutely identical conditions. Therefore, the use of this method of measurement in expert practice will be quite limited until the dependency (the coefficients of distortion) of the linear and angular magnitudes, in relation to the foreshortening in the photos, can be determined.

The Graphic Method. The graphic method of photographic identification is based on systematic construction and comparison of the coordinates of certain graphs. These graphs demonstrate the linear magnitude of straight lines which connect corresponding topographical-anatomical points and the degree of distortion in the contour lines of the corresponding facial segments. The length of these straight lines is measured with the aid of a compass and a ruler, and the degree of distortion in the contour curves, with the help of special instruments. On the basis of the data gained from these measurements in a system of coordinates, graphs are constructed whose

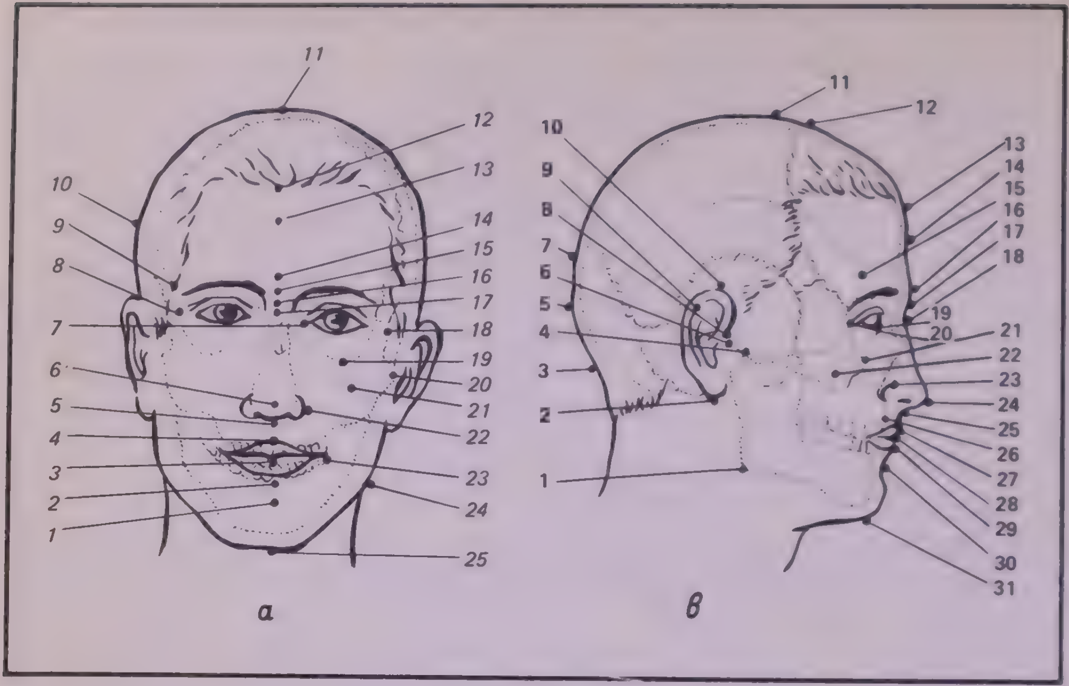


Fig. 32. Anthropometric points on the head
Upper surface:

1. upper chin; 2. lower lip; 3. oral cavity; 4. upper lip; 5. lower nose; 6. tip of the nose; 7. inner corner of the eye; 8. outer corner of the eye; 9. frontotemporal; 10. sinciputal (vertex); 11. crown; 12. point of the hairline; 13. point of intersection of two lines which unite the most prominent points of the frontal tubers; 14. upper glabella; 15. point of convergence of the superciliary arches (glabella); 16. upper nose; 17. deepest point on the bridge of the nose; 18. external ocular; 19. lower ocular; 20. zygoma (cheekbones); 21. lower zygoma; 22. wings of the nostrils; 23. angle of the corners of the lips; 24. angular lower jawline; 25. chin

Side surface:

1. angular lower jawline; 2. lower earline; 3. back of the head; 4. zygoma (cheekbones); 5. most prominent back-extending point on the occiput on a median line; 6. fore-ear; 7. occipital; 8. point of the tragus; 9. tuberculum auricular; 10. upper ear; 11. top of the head (vertex); 12. frontovertical; 13. point of the hairline; 14. point of intersection of two lines which unite the most prominent points of the frontal tubers; 15. frontotemporal; 16. point of convergence of the superciliary arches (glabella); 17. upper nose; 18. deepest point on the bridge of the nose; 19. outer corner of the eye; 20 external ocular; 21. lower ocular; 22. lower zygoma; 23. above the wings of the nostrils; 24. tip of the nose; 25. lower nose; 26. most prominent point at the edge of the gum, between incisors; 27. upper lip; 28. oral cavity; 29. lower lip; 30. upper chin; 31. lower chin

correspondence or non-correspondence form either a positive or negative expert conclusion as to the identity of the individuals in the portrait photographs.

Experiments conducted using this method have given reassuring results. At the same time, additional verification is necessary if the method is to be used in judicial proceedings.

The Method of Coordinated Grids. This method of coordinated grids, like the methods of combined images and superimposition (for these, see below), is used primarily in the examination of same-scale, similarly foreshortened portrait photographs taken under identical light conditions. The given method may also be used in the study of photographs done with minor differences in the foreshortening which do not result in significant differences in those features whose totality is sufficient to enable a conclusion as to identity to be drawn.

In examining photo-portraits with the aid of the given method, so-called coordinated grids are used, i. e. layers of either clear film or glass, on which grids of identical coordinates are marked. By placing these grids on the photographs (which are themselves identical) and on those topographical-anatomical points which are the most stable and clearly defined, the expert is able to determine any coincidence or non-coincidence in the placement of the features under comparison. In order to ensure the illustrative nature of the expert conclusion, the coordinated grids are printed on the photo-reproductions used in the examination.

The method of coordinated grids is usually used in tandem with the visual method.

The Method of Combined Images. The method of combined images consists in cutting notches on one of the photo-reproductions being examined, along the lines which intersect those features most informative and clearly expressed. Having done this, the expert superimposes this reproduction over the second and so is able to determine whether or not the features coincide along the given lines. A complete coincidence is the basis for a positive identification. Often an expert will compare photographs along a median line (a vertical line dividing the face in half). In order to do this, the reproductions of the photographs (in normal and mirror images) are cut along the median line and the left half of one is combined with the right half of the other. The features will coincide if the photographs are of one and the same individual, provided the photos are of identical scale and pose in full-face. Combination along the median line is most often used to determine the degree and character of asymmetry in the face. For this purpose, similar halves (either right or left) of the reproductions, one in normal and the other in mirror image, are combined.

Method of Superimposition (Photoapplique). The method of superimposition (photoapplique) refers to the process by which same-scale, similar pose slides (or negatives) made from portrait photographs submitted for expert examination, are superimposed, one upon the other, along identical topographical-anatomical points. The coincidence of these points is witness to the fact that the photographs are indeed of the same individual. The slides are compared in a projection light. The combined images may be viewed in an enlarged form, projected onto a screen with the aid of a slide projector.

Another form of the method of superimposition is a photo-applique of an X-ray of the skull onto a photograph of the missing person taken while the individual was alive. The photo image of the skull (prepared in the same scale as the photograph) is printed onto the photograph of the individual taken while the latter was alive. This enables the expert to determine any coincidence between the contours of the skull and the head in the photograph. Acute non-coincidence is grounds for a negative identification. It is impossible, on the other hand, to formulate a positive conclusion as to whether the given skull is actually that of the individual in question.

An important fundamental component of photographic identification research is the evaluation of apparent similarities and differences in external features and the evaluation of a sufficient number of features for a categorical expert conclusion. Recently, in addition to the traditional methods for evaluating identifying features, a number of probability and statistical methods have been suggested with the aim of objectifying the evaluation process. These methods distinguish the frequency and identification significance of certain external features. Mathematical methods of evaluation have also been suggested.

CHAPTER XIII

CRIMINAL REGISTRATION

1. The Concept and Significance of Criminal Registration

Criminal registration is a scientifically developed system of recording evidence about people, things, and other objects of criminalistic significance. In case of need, this evidence is used in search, in the course of preliminary investigation and criminal hearing in court with the purpose of tracking down and identifying criminals and material evidence, elucidating various circumstances surrounding a crime, and also for crime prevention.

In the USSR, registration involves specific categories of people, namely those taken into custody, and detained, convicted, and missing individuals.

Also subject to registration are unidentified bodies, stolen things, lost items, confiscated and voluntarily surrendered rifled firearms; bullets and cartridge cases found on the scene of an event related to disclosed crimes; stolen, not found, found or confiscated things of unidentified ownership; and also stolen and wanted, stray cattle and that confiscated from criminals. The system of recording disclosed crimes involves registration depending on the criminal technique used.

The following shall be legal foundations for criminal registration: report of suspect's detention; resolution by procurator, investigator or inquirer to take a suspect into custody; decision to institute legal proceedings against him; and the court's sentence or ruling.

Criminal registration is performed by identifying in specific cases the names and specific outer signs, techniques, and other data about the objects registered.

The main identification methods are verbal description, photography and dactyloscopy (fingerprints). Depending on the method used to store recorded information, registration could involve card files, photographic albums, trace files, and/or collections.

Card files consist of standard or perforated cards.

In some cases, criminal registration involves microfilming of cards, retrieved by a special automatic device. Computer technology is also being introduced into criminal registration. In this case all evidence is coded, and fed into the computer storage.

Criminal registration is verified when so demanded by officials in connection with investigation and court hearing. This boils down to finding out whether a person (or information about whom is to be verified) was previously checked.

Criminal registration helps resolve important investigation problems, for instance:

(a) to find out whether criminal proceedings had been instituted against a given person before;

(b) to trace an unknown criminal, who had escaped from the scene of the crime, and also a person who had escaped from prison;

(c) to identify a criminal by the traces he left or by the method he used to perpetrate the crime;

(d) to track a missing person;

(e) to identify a body;

(f) to establish robbery or loss of specific things;

(g) to establish that several crimes were committed in the same way by the same person by specific technical devices.

2. Registration of Accused and Detained, Convicted and Unidentified Criminals Who Escaped from the Scenes of Crime

The accused, detained and convicted are subject to alphabetical (surname) and fingerprint registration, and unidentified criminals who had escaped from the scene of a crime to registration of their fingerprints and outer appearance.

Alphabetical (surname) registration is peformed with the help of alphabetical cards. These are used to put down the following evidence: last name, first name (if they have been changed, the official in charge of registration shall also indicate the former surname and name), time and place of birth, nationality, permanent address, place of work, speciality and position, family status, criminal record, and legal ground for registration.

After the court had passed its sentence, the following evidence shall be recorded in the card: (a) which court passed its judgement and date of this decision; (b) article under which the accused was convicted, and corresponding punishment.

The card shall also bear the convict's dactyloscopic formula, including the impression of the ungual phalanx of the second finger of his right hand; this would help correlate the alphabetical and fingerprint files. When possible, the file shall also include identification pictures of the registered person.

The cards shall be placed in alphabetical order so that the file could be used to check the identity of a person who reports questionable demographic evidence about himself, or refuses to say anything about his criminal record.

If some of the evidence recorded in the alphabetical card evokes doubt, the verification procedure shall be supplemented by checks in the fingerprint file.

Dactyloscopic registration is performed by means of fingerprint cards. To make them on corresponding forms, printing dye is used to impress the papillary patterns of the fingers of both hands.

The taking of fingerprints should preferably involve the following procedure: if the fingers are dirty, the person in question should be asked to wash his hands with soap. Then the dactyloscopist shall put a small bead of printing dye on a glass or smooth metal plate and uniformly spread it with a rubber roller; the ungual phalanxes of the examinee shall be rolled in the dye and then impressed in the fingerprint card so that the impression would be in the square of the corresponding right- and left-hand fingers. Make control impressions of all fingers (except the thumb) of both hands by applying, not rolling them. All fingerprints must be complete and distinct.

When taking the fingerprints of a dead body, every finger shall preferably be dyed by a special roller with printing dye, and then impressed on a separate sheet of paper placed over a matchbox. The sheets with the impressions shall be glued to the fingerprint card in natural sequence, right and left hands separately.

In case the body stiffens completely, the forensic medical expert shall be asked to cut the tendons prior to taking fingerprints. Also, the expert in forensic medicine shall be entrusted to take fingerprints of mummified (desiccated) bodies and those who had stayed under water for a long time.

Fingerprint cards shall be arranged in definite order by the ten-digit, five-digit and one-digit (monodactyloscopic) systems, i. e., with account for the evidence of attributes characteristic of

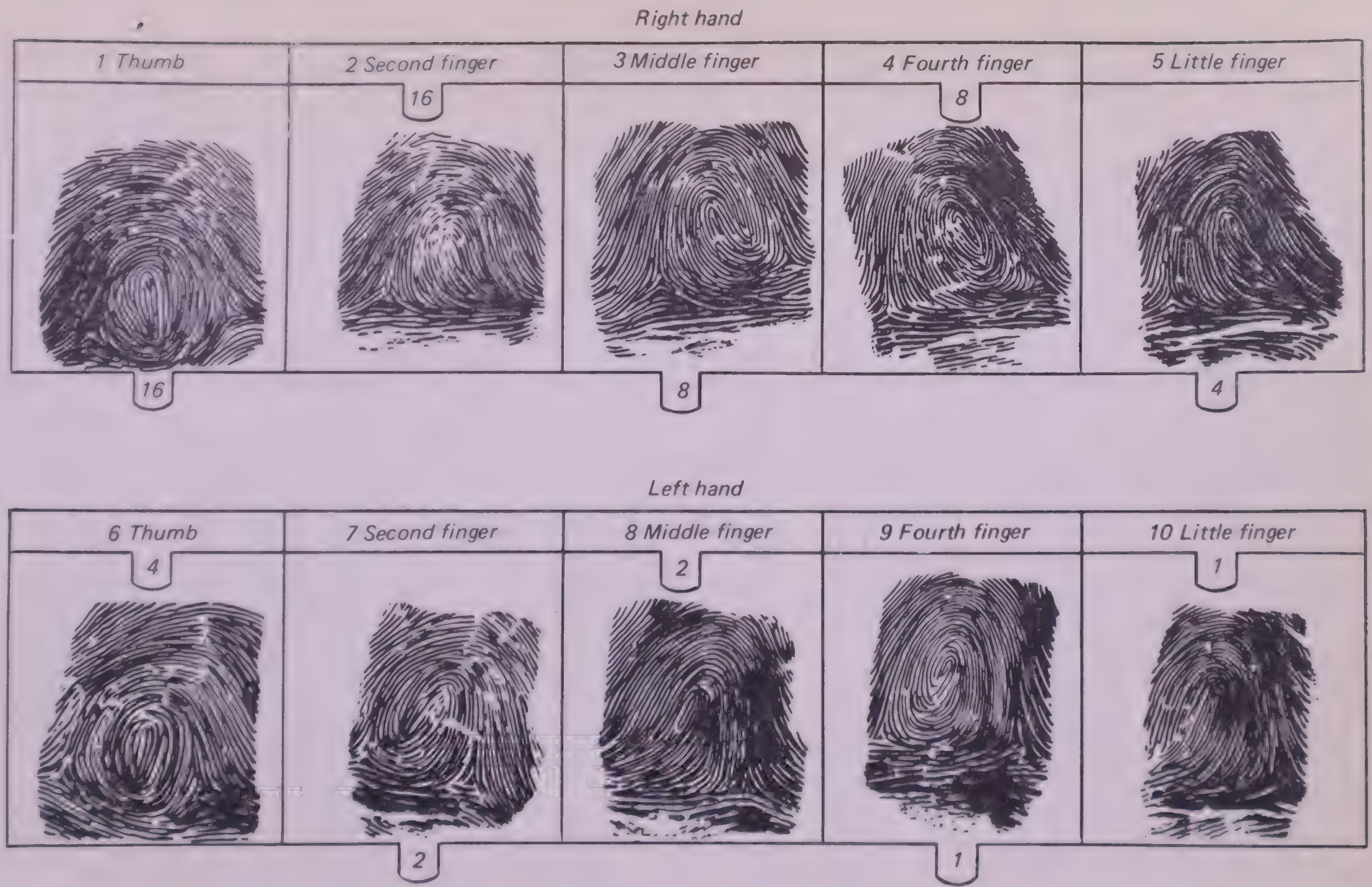

Right hand
1 Thumb
2 Second finger
3 Middle finger
4 Fourth finger
5 Little finger
16
16
8
8
4
Left hand
6 Thumb
7 Second finger
8 Middle finger
9 Fourth finger
10 Little finger
4
2
2
1
1

Fig. 33. Fingerprints on ten-digit registration card

ten, five or every fingerprint separately. The ten-digit system is used to register accused, detainees, and convicts.

The five-digit or one-digit systems are used to record two files, one containing fingerprint cards of people accused of robbery, and the other, photographs of hands of unidentified criminals taken at the scene of event.

The cards are systematised on the basis of papillary patterns, classified as arch, loop, and whorl, respectively.

Patterns, whose inner design consists of arch-like papillary lines that run from one lateral margin of the ungual phalanx to the other without turning back belong to the arch class. Varieties of arch patterns include typical (formed by slightly bending lines), pyramidal (consisting of sharply bending lines) and wedge-shaped patterns with several vertical or inclined lines in the centre (*Fig.* 34, 35, 36, 37, 38, 39).

Loop patterns have an internal design consisting of lines that, starting from the phalanx margin, make a smooth turn in the middle of the pattern to return to the same margin. A loop pattern has one delta — a triangular figure located where the base lines (base of pattern) and peripheral lines (external lines surrounding the inner design on top and on the sides) bifurcate. The loops are classified as radial (with stems turned toward the thumb) and ulnar (with stems turned toward the little finger). There are several varieties of loop patterns due to specific structures of the inner design.

Whorl patterns include those whose inner design is in the form of circles, ovals, ellipses, spirals, etc. As a rule, there are two (sometimes three or four) deltas in the whorl pattern.

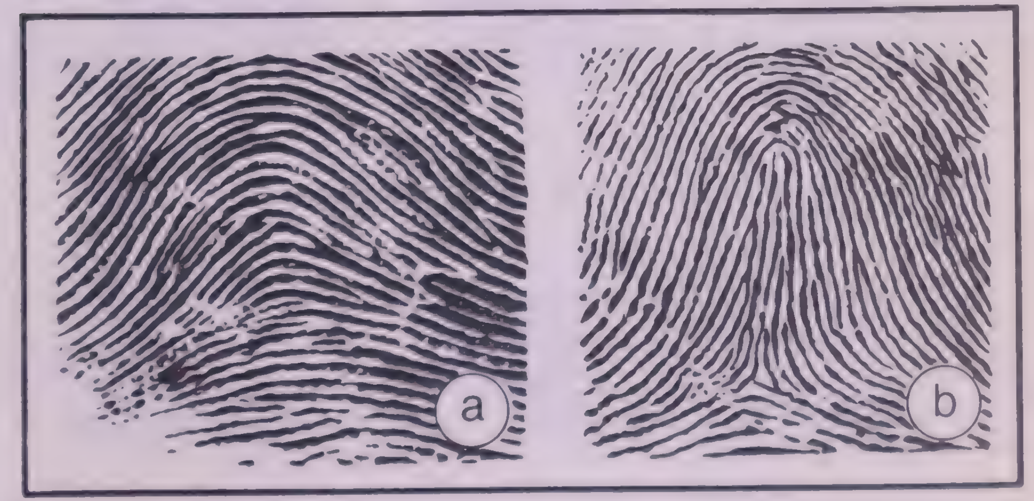


Fig. 34. Arch patterns:
typical (a), wedge-shaped (b)

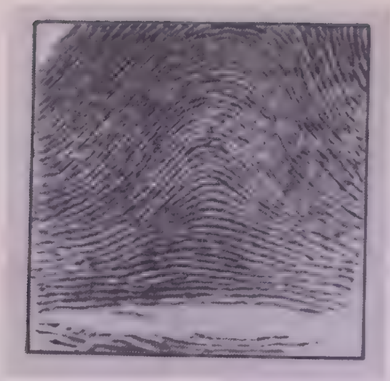


Fig. 35. Arch pattern

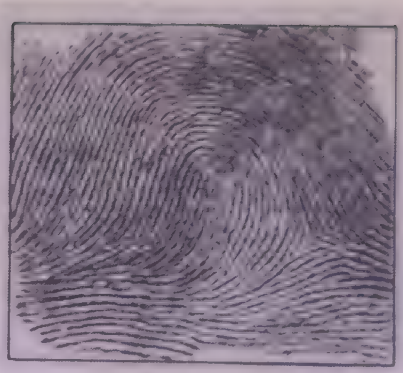


Fig. 36. Loop pattern

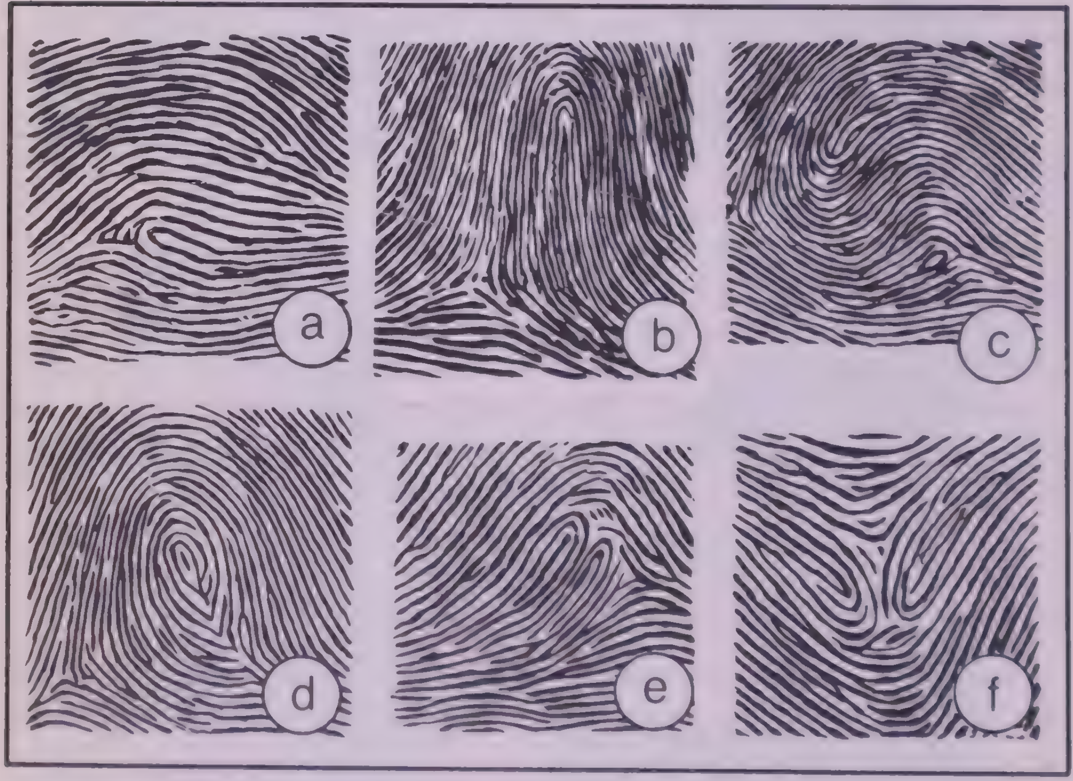


Fig. 37. Loop patterns:

horizontal (a), vertical (b); with "lowered head" (c), composite (d), parallel (e), and counter-running (f)

Systematisation of fingerprint cards is facilitated by the use of special formulae that account for the specifics of papillary patterns. The ten-digit registration formula recorded in the right top corner of the face of the card has the form of two simple fractions.

The first fraction is called the principal member, and the second fraction the additional member.

The numerator of the principal member represents a sum

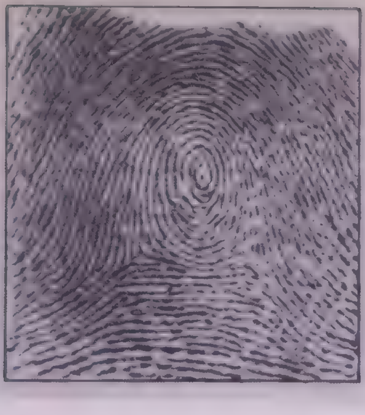


Fig. 38. Whorl pattern

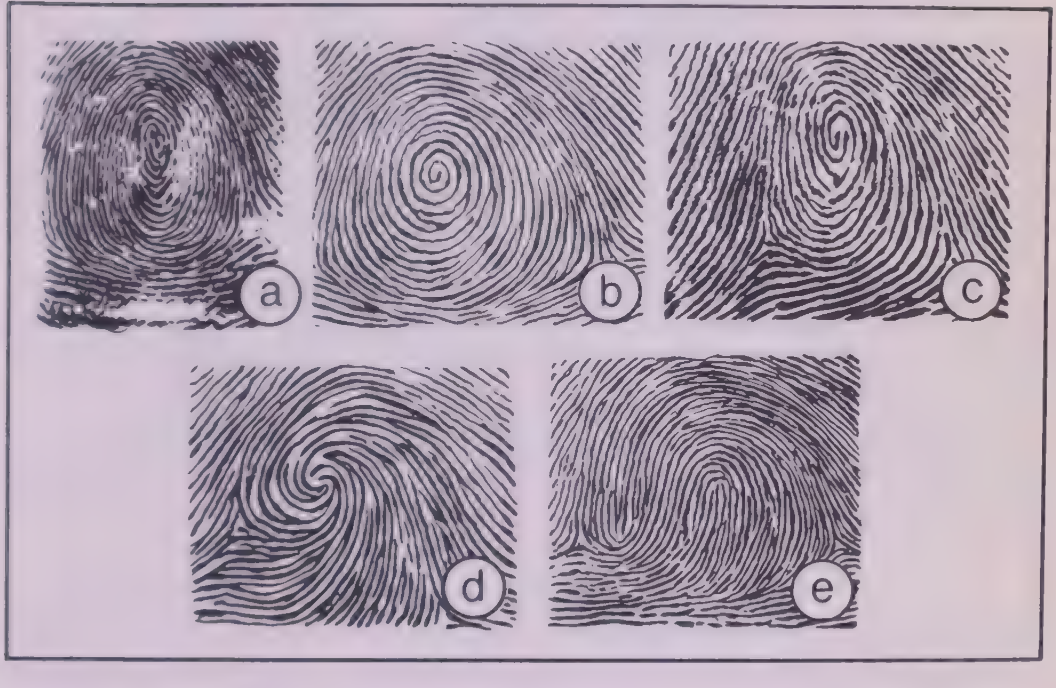


Fig. 39. Whorl patterns:

oval (a), single spiral (b), double spiral (c), snail spiral (d), and heterogeneous whorl pattern (e)

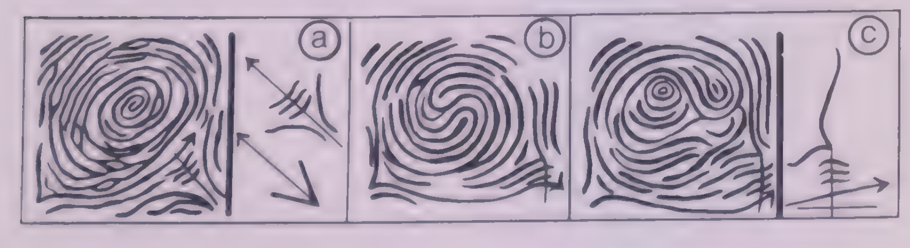


Fig. 40. Deltas in whorl pattern:

inner arrangement (a), middle arrangement (b), and outer arrangement (c) of conventional digital designations of only whorl patterns of the even fingers plus unity, and the denominator the sum of designations of whorl patterns of the odd fingers plus unity. The even and odd fingers are counted from the right-hand thumb to the left-hand little finger.

All the fingers shall be divided into pairs with the following digital designations: thumb and second finger of the right hand — 16; middle and fourth fingers of the right hand — 8; little finger of the right hand and thumb of the left hand — 4; second and middle fingers of the left hand — 2; and fourth and little fingers of the left hand — 1.

Example of deducing the principal member of the formula: whorl patterns are present on the middle finger (8) and little finger (4) of the right hand, and also on the second (2) and fourth (1) fingers of the left hand. Hence

$$\frac{0}{8 + 4 + 2 + 1} + \frac{1}{1} = \frac{1}{16}$$

The additional member of the formula represents a fraction, where the numerator has several non-summable digital designations of all the right-hand finger patterns, and the denominator those of the left-hand fingers.

Cited below are conventional digital designations for various types, forms and varieties of papillary patterns used in deducing the additional member of the formula.

Loop — l; radial loop —2; ulnar loop with 1 = 9 papillary lines between the delta-pattern centre and the bifurcation point, i. e. between the apex of the inner loop or apex of the central line included in the inner loop (*Fig.* 41) —3; loop patterns with 10-13 lines —4; loop ulnar patterns with 14-16 lines — 5;

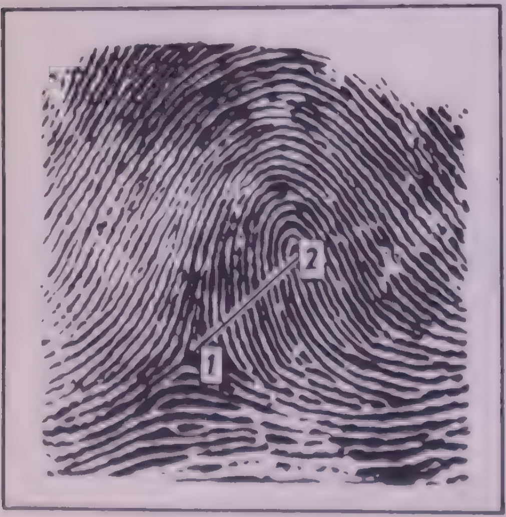


Fig. 41. Reference points for papillary lines in loop ulnar pattern:

1. point of delta bifurcations;
2. apex of inner loop

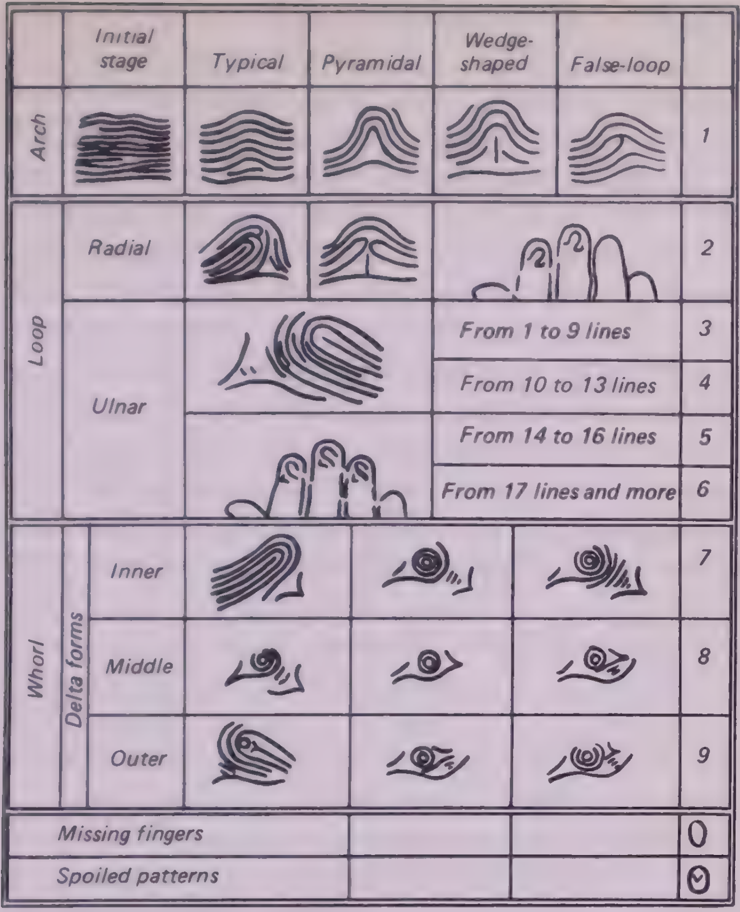

Initial stage
Typical
Pyramidal
Wedge-shaped
False-loop
Arch
1
Loop
Radial
2
Ulnar
From 1 to 9 lines
3
From 10 to 13 lines
4
From 14 to 16 lines
5
From 17 lines and more
6
Whorl
Delta forms
Inner
7
Middle
8
Outer
9
Missing fingers
0
Spoiled patterns
⊖

Fig. 42. Table of digital designations of finger patterns for additional formula

loop ulnar patterns with 17 and more lines — 6; whorl patterns with inner arrangement of deltas[1] —7; with middle arrangement of delta — 8; and with outer arrangement of delta — 9.

Cited below is an example of how the numerator of the additional member of the formula is deduced.

Right-hand finger patterns: thumb — ulnar loop with 12 lines (4); second finger — arch (1); middle finger — whorl with inner arrangement of deltas (7); fourth finger — whorl with middle arrangement of deltas (8); little finger — arch (1). Hence, the numerator will take the form: 4 1 7 8 1.

---

[1] With inner arrangement, the lower branch of the left delta is above the lower branch of the right delta, with more than two lines inbetween. With middle arrangement, the lower delta branches coincide, or contain not more than two lines inbetween. With outer arrangement, the lower branch of the left delta is below the lower branch of the right delta, with more than two lines inbetween.

The denominator is deduced in a similar way, using the conventional designations for the left-hand patterns.

Being not individual itself, the fingerprint formula helps distinguish from the file a specific number of dactyloscopic cards, which when scrutinised and compared in pattern with those of the examined person would allow to pinpoint his card.

Registration of crimes by their perpetration method shall be performed by two interconnected files. The first file would contain cards with descriptions of characteristic criminal techniques used by unidentified persons, and the second file would contain cards describing criminal techniques used by identified criminals. Registration cards shall be systematised and arranged in the files in accord with a number of consecutively recorded features. First, they shall be divided into groups corresponding to specific crimes, each group being in turn classified into subgroups with account for the scene of the event (for example robbery in warehouse, shop, or flat), nature of the technical devices used by the criminal, and so on.

This type of registration by local criminal investigation departments makes it easier to establish: (a) whether several undisclosed crimes were committed by the same person; (b) whether the investigated crime was perpetrated by an individual previously registered as having used some specific criminal technique; and (c) the group of persons, e. g., those previously convicted, that could include the individual who had committed the crime.

Registration by outer appearance shall involve recidivists, certain categories of wanted criminals, and those unidentified escapees, whose outer appearance victims or witnesses still remember. It shall be based on identification photographs and on description of features by the verbal portrait method. The pictures shall be systematised and stored in photographic albums or files (phototheques). Cards with description of outer appearance shall be kept in the form of feature files.

3. Registration of Missing Persons and Unidentified Bodies

This centralised and local registration is designed to establish the cause of unknown absence of people and to identify bodies. It is indexed by two interrelated files, one of which contains cards of missing persons, and the other those of unidentified bodies.

The card of a missing person shall be made in two copies by either the investigator or detective after they had clarified the time and other circumstances surrounding the disappearance of the person in question, his way of life, connections, habits and other characteristics. The card would also record his demographic background, describe his outer appearance, clothes and footwear, which, according to witnesses, were on him/her just before he/she had disappeared.

When possible, the cards shall be appended with most recent pictures of the missing person, a photographic reproduction of his fingerprint card (if available), and pictures of handmarks discovered on objects which he had touched.

The cards shall be systematised first for sex, and then for age and height.

In case of a body no one can identify, the investigator or detective shall fill out two copies of his identification card both indicating where and when the body was found, and also its sex, height, and other features, e. g., those related to the teeth, particular features, clothes, footwear and headgear; the time and cause of death; group and type of blood, and previous illnesses established by forensic-medical examination. When the body belongs to a female, the investigator or detective shall specify signs of virginity, pregnancy, rape and/or abortion. The card shall contain the body's identification pictures, to which its fingerprints and samples of clothes fabric shall be appended.

A missing person's card shall be checked in the unidentified body file, and the card of an unidentified body in the file for missing persons.

4. Registration of Stolen, Lost, Confiscated and/or Surrendered Rifled Firearms, and Also Bullets and Cartridge Cases Discovered on Scenes of Unexposed Crimes

Such centralised and local registration would help trace stolen and lost weapons, and also uncover crimes involving firearms. It includes card files of (a) stolen and lost weapons; and of (b) found, confiscated and surrendered weapons. Bullet and cartridge-case files shall be indexed separately.

Prior to registering a weapon, it shall be checked in the bullet and cartridge-case file to establish whether it contains a bullet or cartridge case fired from that very model and, hence, whether it was used in committing a crime which remained undisclosed.

The registration card shall specify the weapon's type, system, model, year of manufacture, No., characteristic features and structural specifics. The cards shall be systematised and arranged in the file primarily to classify the type of weapon, and then its system, model No., and other features. Bullets and cartridge cases shall be indexed first by their gauge, and then type, system and model of gun from which they were fired.

In addition to bullets and cartridge cases, the collection shall also include magnified photographs of characteristic features of gun elements reflected on fired bullets and cartridges.

5. Registration of Stolen, Found and Confiscated Things. Registration of Sought, Stray and/or Confiscated Cattle

This type of criminal registration helps trace stolen objects. It shall cover diverse public and private property listed as stolen, or found when there was ground to assume that it was originally stolen, left or lost by criminals, and also when objects of unknown ownership were confiscated either during search or detention.

The registration card shall contain a maximally detailed description of the features of the registered object to help identify it. When possible, the investigator or detective shall append to the card a photograph of the object, a photograph of a similar object, samples of fabric from which the object, e. g., a stolen coat, was made. The cards shall be initially systematised for criminalistic significance of the objects in question to specify whether they were stolen or lost, and only then for their respective name (in alphabetical order) and generic and specific characteristics.

Some local criminal investigation departments index files for sought and stray cattle of unknown ownership, or for cattle confiscated from criminals. This registration helps trace stolen cattle and establish to whom it belongs.

PART THREE

INVESTIGATION TACTICS

CHAPTER XIV

INVESTIGATION TACTICS (GENERAL QUESTIONS)

1. A Concept and the Tasks of Investigation Tactics

Investigation tactics is a branch of criminalistics, which includes a system of scientific regulations and recommendations for the organisation and planning of criminal investigations. These scientific recommendations constitute a system of tactical methods which are conditioned by the procedural peculiarities of the investigatory actions, by the conditions of their realisation, and by the particular circumstances of the investigation.

The scientific regulations and recommendations of investigation tactics may be used both in an inquest and/or preliminary investigation by the appropriate agencies, and in court. Accordingly, the term "investigation tactics" is used, not only in regard to the preliminary inquiries agencies, but also in regard to the court.

Investigation tactics includes, firstly, general questions of organisation and planning for an investigation in typical investigatory situations; secondly, tactical methods for the preparation for and the realisation of certain investigatory actions, i. e., the inspection of the scene of the crime, interrogations, searches, and so forth.

The purpose of investigation tactics as a part of the science of criminalistics is to work out, on the basis of extended use of specialist scientific knowledge and generalised court and investigatory practices, the most effective tactical methods for the active introduction of tactical recommendations for the practical work of the investigatory agencies and of the court.

In a successful criminal investigation, one of the most important factors is the formulation by investigation tactics of effective methods of collecting and examining evidence in accordance with the requirements of the law of criminal procedure.

An important role in the formation of such tactical methods belongs to the court and investigation practices, because it is just in the investigation and court examination of the particular cases that their effectiveness is confirmed.

The elaboration of tactical recommendations is realised in the latter's mutual links with the methods and means of crime investigation technique, as well as with the general regulations of the crime investigation system.

Investigation tactics is closely linked with a series of specialist sciences, and information obtained from them is used for the development of their scientific regulations and recommendations. The data produced by psychology, the science of logic, the science of administration and by scientific organisation of labour and other branches of learning form the basis of tactical methods; furthermore, these specialist branches of knowledge affect the development of investigatory methods both directly and indirectly. For example, while psychology has an effect on how investigation procedures are worked out, basically through legal psychology, the influence of biology and medicine acts through forensic medicine and several other specialist sciences.

On the basis of information of psychology, a series of tactical methods has been devised. These methods are used effectively in carrying out an investigation. In the conduct of a search, for example, the method is as follows: the behaviour of those searched is observed, and their reactions to what the investigator does are evaluated, and this often facilitates the disclosure of hidden objects and the revelation of hiding places.

The tenets of formal logic are widely used in preliminary and court investigations. A comprehensive investigation of the conditions pertaining to the crime presupposes a skilful use by both investigator and judge of those logical categories which guarantee a scientific approach to an understanding of the particular circumstances of the crime. Such logical methods as hypotheses, analogies, analysis and synthesis, and induction and deduction, form a scientific base for an understanding of the crime. In particular, a system of proposing and then verifying different theories as to how the crime was committed will:

— help to explain the personality of the criminal;

— reveal the instruments by which the crime was committed, and the means by which it was executed; and

— explain the ways by which the crime was covered up.

As a tactical way of understanding the as yet unknown circumstances of the crime, these theories of how the deed was done have an important meaning for the planning of an investigation. Logical methods of induction and deduction are used in the analysis of causal relationship between facts elicited in the course of the investigation.

The laws of logic are not only used in the evaluation of evidence, but also in the fulfilment of investigatory actions. So, it is important to employ a logical method of analysing information accumulated by the investigator in the course of his inspection of the scene of the crime, interrogation, arrest of the suspect and search. The result will be to combine the application of certain tactical methods of seeking the evidence with the right choice of other procedural actions.

2. A Concept of a Tactical Method and the Criteria of Its Admissibility

Tactical methods worked out by investigation tactics differ in content: some are designed for application in particular investigatory actions (interrogation, presentation for identification, relevant searches, etc.); others have a more general nature (methods of proposing and verifying theories of the crime, and the planning of the investigation). The tactical method used in legal proceedings is the most rational and effective means by which those performing the inquest — the investigator, the procurator and the judges — can speedily and fully disclose the nature of the crime, convict the guilty, and in so doing reveal the truth of the matter.

The use of effective tactical methods in investigation procedures enables the successful completion of a criminal investigation.

The investigator's choice of tactical methods is made on the basis of the comprehensive study of the circumstances of the crime and of the particular investigatory situation, and the admissibility of such tactical methods in the legal proceedings concerned. It is not just any means of solving the procedural tasks of the investigation which will be regarded as the lawful tactical method.

The tactical method must be both scientifically based and legal; it must not oppose the norms of ethics; and it must guarantee the effective use of scientific and technical means in the disclosure and prevention of the crime.

A distinguishing characteristic of tactical methods is the fact that they are based on scientific data of the fundamental branches of learning, in particular of psychology and the science of logic, and also on the general experience of investigating and preventing particular forms of crime.

In the process of a criminal investigation, only those methods which are in accordance with the principles of the law of criminal procedure may be employed.

Tactical methods must also be in accordance with ethical norms. This means that they who are conducting the inquest — the investigator, the prosecutor and/or the judges — in carrying out their professional functions must conduct themselves in accordance with the moral principles of criminal procedure and with the tasks of legal proceedings, so as to ensure that all the guilty will be subject to just punishment, and not a single innocent will be called to criminal account and convicted.

These tasks cannot be solved outside the field and the principles of justice, humanity and professional ethics. During the course of a criminal investigation, the use of those tactical methods which degrade the honour and dignity of the citizen, which involve deceit, force, or the threat of the use of force, is inadmissible. For example, it is not allowed, either to solicit a confession of guilt by threatening the accused, or to demand that he prove his innocence; nor is it permissible to compel the victim of the crime, witnesses or other persons to recreate and demonstrate that which humiliates the individual.

The tactical methods must guarantee the most expedient and effective application of scientific and technical means for the purpose of disclosing and preventing the crime. The tactically correct use of scientific and technical means in carrying out many investigatory actions is often decisive in identifying both concealed traces of the crime and the way of its execution, and information about the personality of the criminal.

Tactical recommendations for the realisation of the procedural activities must be in complete accord with the spirit and principles of the law of criminal procedure. At the same time, the tactical method, though depending to a certain extent on procedural law, possesses such properties as will allow it to be differentiated as a scientific recommendation from the criminal procedural regulations. This is revealed most clearly in their legal nature. To carry out an investigation, observance of the procedural law is obligatory (unless the law permits an alternative). The mode of action stipulated by the law and its legal form are obligatory for both those who invoke the law, and those to whom the demands of the law are addressed. The expediency of application of certain tactical methods is determined by the investigator in accordance with the particular investigatory situation. The demarcation of a tactical method from a procedural rule for the conduct of an investigation, can also be drawn by different legal consequences taking place in circumstances where the procedural law is infringed upon and where tactical recommendations have been incorrectly applied. The inappropriate application of a tactical method will not involve procedural sanctions, while the infringement of the law unavoidably deprives the results of the investigatory actions of their demonstrative powers.

Sometimes in the course of a criminal investigation, so-called tactical operations are involved. A tactical operation is a system of investigatory actions and operational-search measures which are realised by the agencies of investigation and inquest for the most rational and speedy criminal investigation. Such operations are usually worked out and conducted with due regard for a particular type of crime and investigatory situation. For example, tactical operations may be devised for the detention of the suspect in a murder case who is on the run, or for the search and collection of real evidence in the flats of the burglars, and so on. The participants in such special operations act in accordance with the operational plans and by means of joint operations with other participants, each of the latter adhering to a strict sequence and mutual dependence of such operational tactics, all of which are subject to the sole aim of disclosing crime.

Tactical methods elaborated by the science of criminalistics are employed, not only in the course of a preliminary investigation, but also in a court examination. They are used for the organisation of a systematic court investigation, in the process of proposing and verifying suggested hypotheses, and during the examination of evidence. Despite the fact that in the process of a court investigation, the evidence collected in the preliminary investigation is verified by the court's direct investigation thereof, this does not preclude the search for new evidence, as yet still unknown to the investigation. There is, however, a special quality inherent in the tactics of a court investigation. It is caused by the specific nature of a court examination, and mainly by the fact that the principles of public accountability, "glasnost" and immediacy are characteristic of a court investigation as of a court examination in general.

Tactical methods employed in the course of a court investigation must meet those requirements which enable the establishment of the truth in each particular case, substantiation, persuasive and educational influence of the judgement.

CHAPTER XV

THE ORGANISATION AND PLANNING OF AN INVESTIGATION

1. The Concept of the Organisation and Planning of an Investigation

The principle of a systematic and planned organisation is characteristic of criminal investigations, as it is indeed of all criminal proceedings. It is the basis of the law of criminal procedure which: precisely defines the legal means of proof and procedural periods; regulates the order of the criminal proceedings; and specifically highlights urgent investigatory activities, and so on. In other words, the law of criminal procedure rationalises the criminal proceedings by establishing the coherence and mutual interdependence of its constituent parts.

The process of disclosing crime is always complicated. Without precise organisation and planning, such a process is inconceivable. The planning of an investigation is one of the important general principles underlying the techniques of this investigation.

The Organisation of an Investigation Involves:

— the advanced preparation of an agreed plan of action by the local law-enforcement agencies (the investigatory apparatus, the operative-search units and others) in case of dangerous and exceptional events taking place. This plan provides of the appointment of the investigatory team, the operatives, the specialists and the auxiliary personnel for a speedy departure to the scene of the crime; it has to prepare a mobile criminalistic laboratory, means of communication, transport, and all the other means necessary for an examination of the scene of the crime and for the realisation of other urgent investigatory activities; these and other investigatory and operative-search measures are aimed at identifying and recording such traces of the crime as may exist, and at detaining the criminal and carrying out measures of a preventive nature;

— in cooperation with the operative and the investigator, the elaboration of a plan (in cases of proceedings instuted after the successful execution of the operative-search measures) for the realisation of material obtained as a result of these measures;

— the establishment in the process of investigation of an appropriate interaction between the investigator, the operatives, the specialists and the representatives of the public;

— the guarantee of a qualified leadership for the investigatory team set up for the criminal case;

— the organisation of regular meetings of the investigatory team to discuss the results obtained and the next tasks of the investigation;

— the regulation of a systematic exchange of information and the drawing up of reports about the results of the investigatory team and of each investigator;

— the planning, with due account for all the criminal cases concerned, of the investigator's work and the compilation of his schedule of work;

— the guarantee of the technical means and necessary conditions for the investigator's work;

— the guarantee, both of the timely elaboration and precise fulfilment of the investigatory plans, and of the use of all the auxiliary means of such planning; and lastly,

— the realisation of other organisational measures necessary for the successful disclosure of the crime.

The complete package of organisational measures involved in a criminal case must be strictly defined; indeed, they must be quite specific and well worked out in every detail. These requirements should be satisfied in an especially precise manner when team methods of investigation are needed, particularly in those criminal cases involving gangs of criminals operating over a protracted period of time, as it were in many episodes. All those accused or suspected must be assigned personally among the investigators who will then carry out interrogations; the entire volume of work standing before the team of investigators must be distributed among its members in such a way so that some will establish the identity of witnesses and interrogate them; others will identify and study the necessary documentation; and yet others will fulfil the preparatory work for the conduct of an expert examination, and so on.

In cases involving a gang which has committed many criminal acts, another important organisational measure is the working out well in advance of a plan for the visits by certain members of the investigatory team of different towns and villages for the identification of the criminal activities of the accused, and for the collection of all available evidence. If workers from relevant local law-enforcement agencies are needed to participate in the disclosure of the crime, then the heads of such agencies must be informed beforehand in order to get their agreement for the above personnel to be sent on a mission for the fulfilment of specific tasks.

In the organisation of an investigation, nothing is unimportant, no matter how small the detail. Even such a question as the dispensation of the accused now under arrest is significant, because if those who participated in crime are able, while being held in custody, to mix among themselves and to agree on a story about what happened for the interrogations, then the whole process of disclosing the crime will become much more complicated.

The planning of an investigation is just an element of the planning involved in revealing the crime, the latter process constituting a wider and more general problem. Furthermore, planning is characteristic, not only of an investigation, but also of operative-search activities.[1] The method of planning is also employed in the expert examination (with the use of expert theories as to how and why the crime was committed). It follows that the planning of a crime revelation is a common scientific method of criminalistics.

The planning of an investigation does not boil down merely to the mapping out of a plan; the latter is only the external expression of this process, the completion of (in most cases, written) formulations of a definite stage of planning. The planning actually represents the organised and creative aspect of the complicated work of the investigator, an aspect which starts from the first moments and continues to its final conclusion.

In any sphere of human activity, the formulation of a plan involves the setting of definite goals and tasks, the definition of ways and means of achieving them, the naming of those who will undertake the realisation of the plan, and the fixing of specific time limits for the fulfilment of the noted measures.

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[1] Considering that the planning of operational-search activities is a special subject which goes beyond the limits of investigation techniques, it is not touched upon here; examined are only questions of planning an investigation.

The planning of criminal investigations includes the definition of their tasks which are outlined by taking into account the particular characteristics of the crime and the norms laid down in the criminal law and the law of criminal procedure. So the tasks of the investigation are as follows:

(1) to establish the circumstances which are the object of proof in a criminal case;

(2) to identify the location of the criminal, to cut short his criminal activities and to eliminate the possibility of his evasion of investigation and trial;

(3) to initiate measures for the compensation of damage caused;

(4) to carry out measures of a preventive nature so as to identify and eliminate those circumstances which facilitated the crime; and

(5) to undertake measures to guarantee the maximum educational effect of the due court trial.

In any criminal case the following elements are subject to proof:

(1) the time, place, method and other circumstances relevant to the perpetration of the crime;

(2) the guilt of the accused and his motives for the crime;

(3) mitigating and aggravating circumstances affecting the degree and the character of responsibility of the accused, as well as other circumstances characteristic of the personality of the accused; and

(4) the character and extent of damage caused by the crime. Subject to proof is also to the identification of such causes and conditions which facilitated the execution of the crime.

In any criminal case, this general framework of proof is always precisely defined, on the basis of criminal law and by taking into consideration the material fact (the *corpus delicti*) of the crime under investigation. This is so because, in the final account, the criminal law outlines the *corpus delicti* of a given crime (murder, misappropriation, etc.) by defining its objective and subjective elements. This framework is as follows:

(a) an analysis of the substance of presented theories of the crime and a definition of all the conditions (questions) resulting therefrom and subject to verification;

(b) the definition of investigatory activities, of operational searches, of other verification and preventive measures necessary for the investigation of proposed theories of the crime, for an explanation of the questions resulting therefrom, for the establishment of proof in a case and for the solution of the other enumerated tasks of the criminal case concerned; and

(c) the definition of concrete executors of the planned measures as well as a time-scale and a sequence for their fulfilment.

All these elements of planning find their concrete expressions in the plan of investigation.

2. Principles of Planning an Investigation

The following definite principles are characteristic of the planning of an investigation: individuality, dynamism, reality and specificity.

The individuality of planning an investigation is an expression of the specific and unique nature of every criminal case. Despite visible similarities between crimes and the presence of common regulations in the method of investigating them, despite typical tactical methods and universal scientific techniques and the use of analogies in the elaboration of their theories, the investigation of each criminal offense is individual in its nature and is characterised by its own set of particular methods. Just as the execution of a crime is exclusive in its specificity, so is its investigation unique in its specificity, and so too is the planning of its criminal investigation. Despite the general, typical structure of the plan of an investigation, the concrete plan of a criminal case is always unique, and any attempt to scorn the principle of individuality and to replace the concrete plan of investigation by a patterned mould would be fraught with negative consequences.

The dynamism of a plan of investigation is a reflection of the regular development of theories of the crime for the purposes of the investigation. As has already been demonstrated, an investigatory theory in its own development evolves into definite stages of the investigation. By verifying the results emanating from it, additional information about the facts of the case is obtained, new suppositions about the verified circumstances of the crime arise, some theories of the crime fall away, others emerge, and so the process continues right to the conclusion of the investigation and to the establishment of the truth of the case.

This dynamism of the investigation inevitably provokes a dynamism in the planning of investigation and in the continuous updating thereof in accordance with newly received information. In such a way, even the most thorough, and deeply elaborated investigatory plan will be subject to inevitable corrections, and changes and additions will be continually added to it. But just because the plan is "unstable", just because it will be changed and supplemented, it doesn't mean that in the contents of the initial plan of investigation, it is possible to scorn the needs of a thorough and deep analysis of the given material; nor should it be possible to disregard the detailed elaboration of the theories of the crime, the completion of projected measures, and so on. The principle of dynamic planning obliges the investigator opportunely to include into the investigatory plan such necessary supplements and corrections as are in accord with newly acquired information and changes to the investigatory situation. The punctuality of corrections to the investigatory plan is one of the important conditions for the effective disclosure of crime.

The reality of planning an investigation lies principally in the substantiation of the investigatory theories of the crime both in the proposing and in the further analysis thereof. The reality is also expressed in the possibility to logically determine effect factors from these investigations, and in the practical fulfilment of the planned measures for their verification within the given time-scales.

The specificity of planning an investigation means, first of all, the establishment of precise, concrete goals and tasks for the investigation; second, a detailed, concrete analysis of the content of the advanced theories of the crime, and the formulation of precise, concrete questions (and/or circumstances) to be explained in accordance with each such theory; thirdly, the definition of concrete measures applicable to each theory being verified with instructions as to the precise establishment of goals and conditions for the fulfilment of these measures. The investigatory plan as the investigator's effective working instrument must be not only real but concrete. It's no good if it includes such general, abstract instructions, like "identify the conditions in which the crime was committed", "establish the guilt of the suspect" or "interrogate the witnesses", for example. The conditions for verification must be strictly specified, the names of witnesses indicated with an exact outline, and strict succession of the interrogation determined. The specificity of planning an investigation is a pledge for the purposeful and effective work of investigators for the disclosure of crime.[1]

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[1] Sometimes the principle of timeliness is referred to in the planning of an investigation. On the other hand, objections are voiced both against advance

3. The Techniques of Planning an Investigation

The elaboration of a plan of investigation is of great practical significance. In form it may be verbal or written. In the practice of investigations, the written form is used more often than not. In the beginning of an investigation, the investigator usually has the plan fixed in his mind. At this stage, he carries out the initial investigatory activities at the scene of the crime, and he is not yet able to prepare a written form of the plan. However, he cannot proceed without an investigatory plan; right from the start he has to follow a definite — albeit only in thought — and comprehensive well-thought-out plan in accordance with his first proposed theories of the crime. If he fails to do this, his work will immediately acquire a chaotic character and, as a rule, it will be doomed to failure.

Having fulfilled all his immediate tasks, the investigator starts work on drawing up a written plan of investigation. It will include his proposed theories of the crime, questions (and/or circumstances) which have to be answered or explained in each of these theories, investigatory activities and operative-search measures necessary for the verification of such theories, time-scales and a schedule for their fulfilment. Each and every measure must be designated "for action" to a particular individual (the investigator, the operative and/or others).

Using the team-work method of investigating, the leader of the investigatory team with the participation of all its members makes up a general plan for the criminal case and furthermore, each investigator draws up his or her own individual plan of investigation. The specific contents of each individual plan depend both on the sharing of responsibilities between the members of the team, and on the tasks each has received. Responsibilities are shared in accordance with the volume of work involved in the case, the number of people in the

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and retarded planning. It is, however, necessary to bear in mind that planning starts as soon as information as to a crime committed has been received. From that moment, the investigator puts forward his first suggestions and maps out his initial, immediate activities. And in principle, it doesn't matter at this moment what form his plan is in — written or verbal. Planning already started, and there are no grounds to say that it is premature, or opportune; one can talk only of the opportune correcting of the projected plan (and this is included into the definition of the dynamism of planning), but one can't talk yet about opportune planning. It follows, therefore, that timeliness cannot be attributed to the principles of planning an investigation.

team, the number of the verified theories and of the investigated episodes of the crime, the time and place of their commitment, and so on. In such circumstances, the work of each team depends upon these theories of the crime, when each investigator verifies one or a few projected theories; on other occasions, it depends on the episodes of the crime, and in this case each member of the team is commissioned to investigate this or that episode or a few interconnected ones; and thirdly, when the crime concerned was committed in several towns and/or regions, the members of the team will spread themselves out among the various areas, going to various places to carry out separate investigations in each. It is sometimes expedient if one member of the team is commissioned to undertake certain investigatory activities, a search, for example, or the preparation and expedition of all expert examinations in the case. In the case involving a group, the tasks are frequently shared out among the members of the team so that each investigator is commissioned to investigate all the facts of the criminal activity of this or that accused person now brought to trial.

In all designated circumstances, there will be different structures and contents in the various individual plans of investigation. Thus, according to the principle by which an investigation is divided up both by time (i. e., the various episodes of the crime) and space (the different regions in which events took place) the distribution of work of the investigatory team will resemble the plan of investigation cited earlier, and will contain all its basic properties. If the investigator is commissioned only to prepare and carry out certain definite investigatory activities, then it is obvious that his individual plan of investigation will be fragmentary and limited by the framework of the plan of these activities.

In those cases which consist of many episodes and in which a group of offenders was involved, auxiliary means of planning are used alongside the general and individual investigatory plans. Such auxiliary means include the following:

— a diagram of the structure of the criminal gang;

— a diagram of the links between these accomplices in crime;

— diagrams of the circulation of documentation, of the movement of material valuables, the structure of the organisation/association, the technological process of production (mainly in cases dealing with occupational crimes and criminal infringements of safety rules);

— a card index of the accused persons with indications of relevant incriminating episodes;

— available evidence, etc.;

— a list of the accused's "connections" and the operating schedule with the indication of sequence of the work to be done, etc.

4. The Planning of Investigatory Activities

The plans of investigatory activities always supplement the plan of the criminal investigation and make it all the more specific. They, too, may be verbal or written, although the preference is for the written form.

In the plan of investigatory activities, it is necessary to precisely define its goal, the conditions, time and place of such activities; the content of preparatory measures; the particular people involved and their roles; the tactical and technical methods and the means for the fixation of the results. These general elements of the plan acquire definite content in their dependence on the form of investigatory activities and on the particular characteristics of the crime under investigation. For instance, an interrogation plan will to a marked extent differ from a plan of investigatory experiments. In the plan for the interrogation of the accused, attention will be focussed on the subject-matter of the interrogation, on the content (and sometimes on the formulation) of investigatory questions, the sequence in which they are arranged, the identification of mutual relationships between the different participants in the case, a warning about libel, tactical methods of obtaining truthful testimony from the accused, and lastly, the use of evidence. The planning of an investigatory experiment along with the precise goal of the execution of that experiment contains all the elements of its preparation: the identification of the conditions for the verification of the event; a definition of its content, the methods to be used, their sequence, the time of starting and concluding such experimental activities, the limits to which they can be modified and the means for acquainting each of the participants with the content of the forthcoming experiments. In addition, the planning will include the instructions for these experiments, the preparation of the scientific-technical means, transport, communications, and finally, the system of signals and protection to be used. The plan also indicates the concrete conditions, the time and place for the conduct of the experiment, the participants therein and the particular functions of each, and lastly, the planned means for fixing the conditions, the process and the results of the investigatory experiment.

The content of the plans of investigatory activities depends on other factors, too. For example, the plan for interrogating an accused who has acknowledged his crime differs in content from that for a person who denies his guilt. Even the plans for interrogating the accused, for example, of murder, theft or of occupational crimes, will differ to a certain extent.

The successful completion of planned investigatory activities is the most important condition for the efficacy of the whole investigation. In the final account, its success depends on the qualified planning and realisation of the investigatory activities in the disclosure, fixation and investigation of evidence.

CHAPTER XVI

TACTICS FOR THE INSPECTION OF THE SCENE OF THE CRIME

1. General Principles

Regardless of whether they were caused by a dangerous activity or negligence taking place in society, criminal events involve some alteration in the immediate environment. An analysis of the changes in the surrondings allows for the observation of traces and other real evidence. The *inspection* of the scene of the crime is one of the most important investigatory activities intended to the identification and examination of the traces and other real evidence, as well as to the identification of the conditions in which the crime was committed and equally of other conditions relevant to the case.

During the inspection, the observation and study of the changes which took place or of the traces of the crime, as well as of the conditions in which it was perpetrated, will both facilitate an understanding of the truth and allow for the fuller and deeper investigation of the circumstances of the crime.

In the course of the investigation, it is obviously necessary to inspect the following:

— the scene of the crime, and the locations and facilities not associated with it in different vicinities;

— the objects and documents relevant to the goal of disclosing clues of the crime;

— the corpse;

— the body of the person (be it the accused, the suspect, the witness or the victim) for the identification of traces of the crime or for the presence of particular features;

— correspondence and other objects annexed to the case as real evidence.

The inspection of the scene of the crime is most widely used and complex. Therefore the tactical methods are basically regarded as being applicable to this type of examination although they may be applied to other forms too.

The *scene of the event* means that territory or premises where the event under investigation took place or where its result took place. It can also mean that territory or premises where the crime was prepared or where its consequences were observed (this may be the place where the corpse was found, the place of a theft of goods, of instruments used in the crime, or a place where traces and other real evidence were found).

The surroundings of the scene of the event are those various objects, located at any part of that scene, in their mutual interdependence and in their totality.

As a rule, the inspection of the scene of the event gives extensive information for the construction of theories of the crime and for the definition of the further development of the investigation.

In the process of inspection, the investigator acquaints himself with the surroundings; he tries to find, study and evaluate various material objects, their characteristics, condition and relative distribution; he discovers the mutual interdependence of the objects and phenomena, and reveals the contradictions between them. The investigator in the course of the examination builds up logical conclusions about the event and of other facts relevant to the criminal case. To ensure that the information collected by the investigator will be effective evidence, he is obliged to fix it in a proper manner, and to take measures to protect the traces and other real evidence.

An indispensable condition for an effective inspection of the scene of the event is the observance of procedure and tactical methods, the skilful use of scientific and technical means, the appropriate fixation of the progress and results of the examination.

There are three types of inspection: initial, the re-inspection, and the supplementary inspection of the scene of the event.

In the *initial inspection* of the scene of the event, all the various objects situated there are examined fully and thoroughly. As a rule, it is the most effective of the three types of examination, as the relevant circumstances have still not undergone any marked changes. The essence of an initial inspection does not change, even if prior to the arrival of the investigator, the scene of the event was examined by a departmental commission (for example, an examination of the scene of the event in the case of an infringement of labour protection rules).

A *re-inspection* is a new and full examination of the scene of the event which has already undergone an examination. The necessity of same arises in those cases when the initial inspection was undertaken in unfavourable conditions (for example, meteorological) or when it was of poor quality.

A *supplementary inspection* is undertaken in those cases when in the conduct of further investigations after the initial examination, it became apparent that certain objects at the scene of the event were not inspected either sufficiently or at all. A supplementary inspection applies only to those objects which have been thereby stipulated.

In the conduct of re-inspection and supplementary inspection, the same rules of procedural law and the same tactical methods are applied as were employed in the initial examination.

As a rule, in the process of preparing and carrying out an inspection, there arises the necessity:

— for a preliminary and parallel realisation of a series of organisational and operative-search type measures; these are necessary for the identification of those who were eyewitnesses to the crime or other witnesses, and of their interrogations;

— for an inspection of those areas adjoining the scene of the event;

— for the use of search dogs, for the hot pursuit of criminals, for the organisation of observations, and so on. Sometimes the need arises for the speedy conduct of other investigatory activities — interrogations, investigatory experiments, expert examinations, and so on—at the same time as the inspection is carried out.

The Participants in the Examination of the Scene of the Event. The legislator places the responsibility for the conduct of the examination of the scene of the event on the *investigator (or on the person conducting the investigation).* He must be personally convinced of the existence and the character of certain definite facts and conditions, and he must enter in the minutes only the results of his own observations. In addition to this, he is endowed with the organisational function for recruiting, deploying and employing other participants in the inspection; they will be invited to help the investigator in the examination. The directives of the investigator must be obeyed by all persons participating in the inspection.

In the course of the inspection, some *specially invited witnesses* will be called in to verify the facts, the content and the results of the activities undertaken by the investigator. They must personally witness all that has been found, examined and fixed in the course of the inspection. The investigator in his turn must draw their attention to all the traces he has identified and to any other circumstances. They will have the right to comment on any of the investigator's activities and to draw his attention to this or that circumstance. Persons called to be witnesses to an inspection must be individuals disinterested in the case. However, in studying the special nature of the scene and the character of the events which have taken place there (for example, in cases of an infringement of safety rules in an industrial enterprise, mine or a building site), it is recommended to call for witness duty those who are familiar with the character of work of these industries.

Police officers may also be called in to the conduct of an examination of the scene of the event. They will help the investigator in the preparation and conduct of the inspection, and they will maintain order and guarantee the protection of the scene of the event. They might be commissioned to question those persons living in the immediate vicinity of the scene of the event, to identify eyewitnesses of the event and other witnesses. They are responsible for the realisation of the operative-search measures involved in the hot pursuit of the criminal, in his arrest, in the search for stolen goods and/or instruments of the crime, and for the organisation of protection of the site under inspection, and so on.

The victim, witnesses, the accused and the suspects will be called to the inspection when they may help either to identify the traces and other real evidence, or to explain the conditions and circumstances of the event. In the course of same, the investigator should initiate measures to make sure that they don't use their involvement in the examination to hide or destroy traces of the crime.

If the event under investigation took place on the territory or in the premises of enterprises, institutions and/or other organisations, *the representatives of these administrations* may help the investigator find his bearings at the scene of the event: they may give an outline of the character and special features of the work of the enterprise involved; and they may describe the system of guards and signals, the distribution and location of the various departments, and the arrangement and construction of the separate workshops, etc. The investigator will seek their assistance both in the acquisition of technical facilities and auxiliary staff necessary for the inspection, and in other similar matters.

If the situation so demands, the investigator has the right to call for *specialist* participation in the examination of the scene of the event.[1] The latter will assist the investigator in finding whatever first traces there may be, in the preliminary examination and the fixation of real evidence. In a word, he will help to establish the nature of the events concerned.

The basic, tactical principles of an inspection of the scene of the event are its timeliness (immediacy), planned nature, objectivity, thoroughness and completeness.

Timeliness (Immediacy) of an Inspection. The inspection of the scene of the event is an investigatory activity which is performed immediately upon receiving information about this event. A delay in the departure to the scene of the event may result in the intentional or unintentional alteration in the surroundings of the event, to the loss or damage of traces, and other real evidence, and to the appearance of other traces and material objects at the scene which have no bearing on the matter in hand and which could lead the investigators astray.

Immediacy is also necessitated by the fact that, as a rule, the inspection will give material for the formulation of a theory of the crime, and for the choice of a correct line of investigation. All this leads to the basic recognition of the fact that an inspection of the scene of the event is an urgent investigatory activity and the latter, as a rule, is an initial one. In taking this into account, the legislator may allow an inspection of the scene of the event to take place right up to the initiation of criminal proceedings, but only as an exception to the general rules and in those circumstances which brook no delay.

An inspection may be carried out at any time. In unpleasant conditions (at night, for example), the investigator will organise the protection of the scene of the event, and undertake measures to preserve the surroundings thereof in their original form; he will then, later on, carry out his examination in normal conditions.

The Planned Character of an Inspection. The inspection of the scene of the event must take place according to a predetermined plan so as to achieve, with the tiniest loss of effort and time, the maximum results. An unsystematic approach in the conduct of the inspection will be fraught with the danger of losing important circumstances of the event and of leaving separate sectors unexamined. Having chosen a definite approach to the task in hand, the investigator must submit himself to the orderly inspection of one object at a time.

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[1] The external examination of a corpse in the place where it was first discovered, as well as the exhumation of the corpse, must take place either in the presence of a doctor who specialises in forensic medicine, or, if such is not possible, of another doctor.

The planned character of an inspection does not exclude the introduction of corrections into the original plan. Traces and objects found in the process of inspection may serve as a basis for new theories of the crime which must be immediately submitted to verification. There may follow an amendment to the original plan, and supplementary examinations of sectors already inspected.

The objectivity and thoroughness of that inspection suggests the investigator must not express a preference for any one of the proposed theories of the crime, whatever authentic they may appear. He is obligated to examine all the circumstances of the scene of the event to the full; to look for and fix various traces and other objects which might in the future be real evidence in the criminal case; he must also ascertain the circumstances necessary for the verification of everything emanating from each proposed theory. During the repetition of an investigatory activity, it is sometimes very difficult if not indeed impossible to establish what was not recorded in the first examination of the scene of the event.

The investigator conducts the inspection of the scene of the event, not only for the immediate recreation of the surroundings thereof and for an explanation of the essence of the event, but also for the future trial. Therefore, in the conduct of the inspection, he must establish and determine information necessary for answering those questions concerning the scene of the event which will be asked later by the investigator and the judge in the court examination.

The Active Character of the Inspection. In the course of the inspection, the investigator does not restrict himself to a passive observation of that which is most visible. His efforts must be directed to an active search of the various traces and objects. On the scene of the event, there will frequently occur seen traces and particles of substance which will be barely visible or even invisible; yet it is the examination of these at the level of contemporary expert examinations which may establish the essential characteristics of the event. Therefore the creative nature of the inspection may also presuppose the use of criminalistic technology.

The Circumstances of the Event Liable to Be Established in the Course of an Inspection. The purposefulness of the investigator will guarantee the fullness of the inspection. He must define in advance the set of circumstances to be subject to explanation in the course of the inspection. Connected thereto are the following:

(a) the general character of the location or premises, the geographical relief of the location, the boundaries of the scene of the event, the existence of roads and paths, adjoining buildings and other objects, and approaches from where the location and the premises were in sight;

(b) the circumstances of the scene of the event. In relation to every object found on the scene of the event, there must be explained its purpose, origin, position relative to other objects; and there must be defined its generic signs and individual characteristics, its measurements, and lastly, its constituent parts;

(c) the changes caused by the event. The investigator will establish the changes in the circumstances as a result of the offender's actions. He will identify the existence of various traces and objects imported into the scene of the event or, in contrast, the absence of certain objects and items which inalienably belong to that scene in normal circumstances;

(d) the signs of a situation being feigned, negative circumstances. In the conduct of an examination, the investigator must always bear in mind the possibility of a situation being feigned. This means premediated change by the criminal of the prevailing circumstances. Such a change may be in the form of deliberate chaos, or in the presence or absence of these or those traces and objects. All this is done with the aim of misleading the investigator's efforts. A criminal will often leave somebody else's papers or possessions, and make use of the shoes or other objects belonging to outsiders.

The motives of feigning may be varied: the feigning of one crime may hide another; or the feigning of an uncommitted act may hide the fact that a different crime has in fact been committed; or the creation of visible evidence of a crime committed may conceal facts of a non-criminal nature; or lastly, the false presentation of separate elements of the crime committed may somehow serve the criminal's dubious purposes.

The feigned character of the scene of the crime may be expressed as follows:

(a) the demonstrative character of symptoms of the criminal event. In imitating the event of the crime, the offender sometimes loses his sense of proportion and creates extreme chaos, unjustified and thoughtless destruction; in so doing, he leaves a number of traces expressed in unusual clarity (but in a real situation, the criminal usually tries not to leave such traces, and all of his attention is focused on the achievement of his criminal goal).

(b) the presence of negative conditions, i. e., facts and phenomena manifestly not connected with the particular circumstances of the crime under investigation. This may be expressed either in the presence on the scene of the event of objects, traces and symptoms which are unusual for that place and/or situation, or in the absence of those things which are nevertheless essential for the circumstances of the crime concerned.

(c) conditions which facilitated the perpetration of the crime. In the course of the examination, the investigator must turn his attention to those circumstances which facilitated the perpetration of the crime such as the poor locking conditions of premises, the incorrect protection of inflammable materials, the absence of a system of signals or of fire-prevention equipment, etc;

(d) objects liable to obligatory removal. In any examination, the investigator must pay attention to the presence of objects taken out of general circulation, and whose possession requires special authorisation. The investigator must also pay due regard to any unusual quantity of the various objects involved.

The Construction and Verification of Theories of the Crime in the Course of an Examination. The investigator carries out an immediate perception and study of the scene of the event and of the various relevant objects according to a defined plan, and this is based on and corrected by the theories of the crime. In the course of the examination of the scene of the event, these theories acquire a double significance. First of all, they allow the investigator to conduct the examination in an ordered manner, according to a defined system and direction, and thus they facilitate the identification of certain facts and circumstances. Second, they permit the investigator to decide objectively the significance of the facts and circumstances which he has established for the purposes of the criminal investigation to follow; furthermore, the theories help define the relationship of the traces, objects and other items to the event under examination.

The investigator initiates the formulation of a theory of the crime as soon as he has received some initial information. Information about the event that took place which has been forwarded to the investigator usually contains a small amount of data but enough to make up general theories of the character of the event. On the basis of these theories, the investigator should decide whom to invite to take part in the inspection; he should define the scientific and technical means necessary for the conduct of the inspection, delegate tasks in accordance with decisions previously taken for the protection of traces of the crime, and make other decisions resulting from the particular circumstances of the case.

On the scene of the crime, the investigator receives supplementary evidence as a result of his observations of the locality and of the questioning of witnesses. Thus he is able to introduce corrections into the theories of the crime already constructed, and plan further activities for their verification. In the course of the inspection, every newly observed circumstance is evaluated and included in the process of verification of the projected theories. In such a way, the formulation of the theories has a guiding character and brings to the examination both a methodology of organisation and a purposefulness. The investigator undertakes energetic activities in the search for traces and other objects in the line of the investigation defined by the proposed theories.

The various objects, their special characteristics, their relative disposition and condition, all lead to the most varied information. In the course of the examination, the investigator must decide which objects and conditions might have a special significance for the criminal case in question, and which are of no interest. Those of them in relation to which there are reasons to formulate theories about their connections with the criminal event should be recorded and examined. It is sometimes difficult to decide the role of several objects and circumstances, but they must all be submitted to examination and final recording, for they may be significant for the case in question.

2. The Preparation of the Examination of the Scene of the Crime and the Tactical Methods Used

First of all, the investigator must demonstrate his professional readiness to carry out an examination of the scene of the crime at any time. Of importance are preliminary activities carried out by the investigator upon receiving information about the event concerned, and those performed after reaching the scene of the crime.

To be ready, in the full professional meaning of the word, to carry out such an examination, the investigator must have definite theoretical knowledge and a practical understanding of how to effectively undertake his investigatory activities. Professional readiness also includes his psychological preparedness for conducting the examination, i. e., his readiness both to calmly yet creatively work in the most complex conditions, and to skilfully lead the examination. Furthermore, his professional readiness includes the investigator's ability to orientate himself on the scene of investigatory operations, to know the disposition of enterprises, offices and organisations, post offices and railways, and finally, to be familiar with the whereabouts of first-aid centres. In this regard he will find helpful information in maps and plans of the town (district), in lists of offices, enterprises and organisations with their addresses and telephone numbers, in timetables of all forms of transport, and in reference books about the condition of the roads during the different seasons of the year. He should also know well in advance who can be brought into the examination in a specialist capacity.

The investigator must maintain in constant readiness his individual set of scientific and technical resources, and he should continually supplement same so as to always have a complete set. The examination of the scene of the crime sometimes continues for a few hours in the most unpleasant conditions; the investigator must be ready for just such conditions.

Upon receiving information about the criminal event, the investigator will spell out:

— who and wherefrom reported the said event,

— the character of that event,

— where it took place (the exact address or locality),

— who was the first to observe same, and when this happened,

— whether or not there are any victims of the crime, and if so, what is their condition,

— what sort of assistance or treatment they have received,

— whether or not there is a danger for the life and/or health of any persons, or a threat to destroy valuable materials,

— who has been informed of the event, and lastly,

— whether or not there is a representative of the local authorities on the scene of the crime.

In addition, he will issue instructions: for guarding the scene of the crime and initiating appropriate measures necessary for the protection of traces and various objects; for removing outsiders from the scene of the crime; and for guaranteeing the preservation and inviolability of the surroundings of the crime.

Furthermore, he will undertake to render assistance to the victims of the crime, and endeavour to liquidate the danger to people's lives and their health, and the threat that valuables may be destroyed. The investigator will decide whom to invite to participate in the examination; he will initiate measures for the transfer of the corpse, real evidence and valuables; he will verify the readiness of his scientific and technical and auxilary resources necessary for the conduct of the inspection; and he will issue instructions for the identification of eye- and other witnesses, for the establishment of the identities of the victims and suspects, and for the initiation of measures to search for and arrest them.

When present on the scene of the crime, the investigator will check up on the fulfilment both of his directions for guarding the scene of the crime and his other instructions. Where necessary, he will initiate supplementary measures. He will spell out which steps were initiated prior to his arrival, with a view to establish the circumtstances of the crime. In addition, he will receive initial information about the criminal event, and delegate tasks for the conduct of operative-search measures and for the use of search dogs. He will also verify the presence of those persons appointed to participate in the examination, and explain to them the sequence of inspection, the role of each, and their rights and responsibilities.

Having carried out the necessary preparatory measures, the investigator will initiate the conduct of the inspection.

The inspection consists of three separate stages: a general observation of the scene of the crime comes first; there then follows a detailed examination; and after that comes the final stage of the examination.

The general observation of the scene of the crime is carried out by the investigator with the aim of acquainting himself with, and of forming a preliminary idea about the scene of the crime and the possible existence of traces. The scene of the crime is sometimes examined from different points. During the course of the general observation, the boundaries of the territory which are to be submitted to examination will be defined. They will be marked in such a way so as to include the entire locality (premises) in which traces and relevant objects may be detected, and those conditions facilitating a successful investigation be established.

As new information is received, the boundaries may change and additional areas may be examined. In delimiting the boundaries, one should be guided by the following rule: it is better to extend the boundaries than to leave a certain part of the territory or premises unexamined. It is always possible to carry out a general observation or even a thorough examination of separate areas, beyond the boundaries of the scene of the crime. If traces of the crime are observed in these areas, they will then be submitted to examination.

During the course of his general observation, the investigator projects his plan of examination, i. e., he decides from which initial point the inspection will proceed. He determines its sequence and direction. In addition, he resolves which methods and means of examination shall be employed, and takes orientation and survey photographs.

By following definite lines of inspection, he endeavours right from the start to obtain the fullest possible picture of the character of the event.

As a rule, the examination more often than not starts from the centre of the scene of the crime where the largest quantity of its traces are concentrated. This is the so-called excentric method of examination. In such a case, the inspection follows the course of an unfolding spiral, from the centre to the periphery, so encompassing in the examination all parts of the scene of the crime.

When it is difficult to establish the centre of the scene of the crime, the concentric method of examination is used, i. e., from the periphery to the centre. In such a way, traces of the criminal who has now gone into hiding, as well as other traces and real evidence in the large area, can be more successfully detected.

The examination may be conducted from one boundary of the scene of the crime, known for this purpose as the original boundary, to the opposite one. This is the frontal or linear method of examination.

An extensive territory will be divided up into separate parts, either by natural borders or via the use of landmarks; the examination will then be carried out in each part in turn.

It is also possible to use a combinaton of these methods of examination. But whichsoever method or combination thereof is chosen, it is very important to make sure that the entire scene of the crime is thoroughly examined. Therefore, in any method of examination, it is necessary to pay strict attention to the chosen pattern, and to record those parts already examined.

For this or that reason, certain changes to the circumstances of the scene of the crime might have taken place prior to the arrival of the investigator. Regardless of how much authentic information about the changes that have taken place may be available to the investigator, he is not obliged, on initiating the examination, to undertake any activities for the reconstruction of the original conditions.

On initiating the examination, he undertakes certain measures so as not to change the general condition of anything, and so as not to damage the traces on the scene of the crime; in addition, he projects the route for the movement of the participants in the examination and advises them to follow the directions indicated and not to touch the various objects at the scene of the crime without his permission; nor should they throw away any pieces of cigarettes and even the smallest parts of any other objects. Detected traces and/or objects which may have some significance for the case in question are fenced in or covered prior to their removal, in order to avoid any possible damage.

In the course of the examination, both static and dynamic methods are applied. The *static method* consists of an examination of the scene of the crime and of separate items of real evidence *in situ*, without transferring anything. The *dynamic method* is an active, comprehensive study both of the scene of the crime, and of the various objects and traces situated thereat.

The static method is applied for the inspection and fixation of the circumstances of the scene of the crime in that form in which they existed at the start of the examination. The static method of inspection always precedes the dynamic one. The examination of separate sections (objects) of the scene of the crime usually takes place according to this sequence. For example, such sections (objects) may be represented by a safe smashed open, a door or a window broken by burglars in order to penetrate into a building, and the latter's floor on which footprints, cigarette butts and so on are detected. The investigator, while not changing in any way the original state of all the various objects in each such section, examines and fixes their condition, disposition, measurements and other characteristics. After all these measurements have been established and all the objects photographed, then it is time to transfer to the dynamic method of examination. The objects are moved and examined in an advantageous position, they are photographed and all their specifications are described anew; and finally, the various individual objects or parts thereof along with the traces are taken away, and copies of the latter are manufactured.

In the examination of each of the detected objects, the following will be defined: what that object represents, its location on the scene of the crime, and its external appearance. Depending on the character of the object and its significance for the case in question, the need may arise to investigate and record its form, weight, measurements, the matter from which it was made, its colouration, and the presence of any hallmarks or other brand-cum-trade marks. For example, in examining the corpse at the place where it was first discovered, the investigator will record its exact location on the scene of the crime, the pose and position of the corpse, the condition of its clothes, the character of any injuries, the existence of any putrid odours, and lastly, the presence of any murder weapons.

During the course of the examination, they will record the measurements of the traces and objects, as well as the distances between them. Where necessary (for example, in those circumstances in which a corpse has been discovered), they will also measure the air temperature. The exactness with which the objects are measured will depend on their size and on their significance as far as the relevant process of crime detection is concerned. Small objects (such as bullets and empty cartridge cases) can be measured with sliding callipers (accurate to within 0.1 mm). Where necessary, large-scale objects will be measured with great accuracy. In measuring linear magnitudes, tape-measures, rulers and/or a slide callipers will be used.

Along with the measurements of the various separate objects and traces on the scene of the crime, the investigator and his team will also fix their exact position. This is achieved by establishing their range (and bearing) from two stationary reference points. In premises, these could be two walls displaced at right angles to each other. This system of coordinates fixes the position of an object by using the shortest possible distance from that object to the reference point concerned, i. e., the perpendicular distance, in this case, from the object to the wall. In this system, the particular points of the objects from which all measurements are taken must be indicated: "from the sinciput of the corpse", "from the muzzle of the gun". In carrying out these activities, they must endeavour to achieve the maximum possible exactitude in establishing all measurements of, and all distances between, the various objects because after the examination, it is usually not possible to re-establish such measurements.

The success of the examination of the scene of the crime depends to a large extent on the investigator's skilful use of scientific and technical means and methods, of special apparatus and portable equipment for detecting and recording invisible and poorly visible traces. The investigatory brief-case contains the comlete set of scientific and technical resources for the examination of the scene of the crime. In a number of instances, it may be necessary to employ supplementary instruments, appliances, equipment, packing material, etc. Some of these are at the disposal of criminalists (for example, there is the crime-detection public prosecutor's kit and the mobile criminalistic laboratory); the delivery of any other equipment to the scene of the crime is the responsibility of the investigator. The widest disposal of criminalistic resources for use in an examination of the scene of a crime includes the following:

— search and analytical equipment and instruments (probes, sweeps, augers, magnetic lift searchers, metal detectors, ultraviolet projectors, electronic optical transformers) and so on:

— special micro-projectors for the examination of objects in especially difficult light conditions;

— equipment for the fumigation of objects by using substances able to detect invisible traces (e. g., iodine pipes);

— powders, solutions and other indicators for the identification of invisible traces;

— optical instruments;

— materials for producing copies of the traces.

In the final stage of the examination, the investigator evaluates the accomplished work, and checks up whether all necessary search activities have been fulfilled. He then wraps up the traces, their copies and other real evidence which are to be taken away from the scene of the crime, providing each with an identification label on which confirmatory notes may be written; at the same time, he undertakes measures to preserve those (cumbersome) objects of real evidence which will not be removed from the scene of the crime. He also makes a careful examination of the completed reports of the other participants of the inspection, and takes decision thereon. Finally, the investigator should write out a report of the examination of the scene of the crime and the plans and diagrams thereof, and having signed the documents according to the procedure, must direct that the surroundings at the scene of the crime be brought to order.

3. The Recording of the Results of the Inspection of the Scene of the Crime

The recording of the results of an examination involves the exact and full description of:

— the circumstances on the scene of the crime and of its separate parts,

— the detected objects and traces, their condition and particular characteristics, and lastly,

— the actions undertaken during the course of the examination and the results thereby obtained.

The conduct and the results of the inspection are to be written down in the record of the examination of the scene of the crime, and the following are to be enclosed therewith: plans and diagrams of the scene of the crime, as well as illustrations, photographs and film-reels, and moulds and impressions of the traces.

The record covers all investigatory activities undertaken, and all the scientific and technical means employed during the course of the inspection; furthermore, they register all the detections made during the inspection in the sequence the latter was conducted, and in the form in which each detection was observed at the moment of examination. All objects and traces removed during the course of the examination are also enumerated and described in the record.

The record of the examination is its final stage. However, a rough draft of the record and separate notes are prepared throughout the entire examination so that in the end, when the final record is collated, nothing should be omitted. During the examination, the investigator writes down his various notes in his working notebook. To this end, he may well use a portable tape-recorder. In the course of the examination, he may put on tape all his observations, the reports and explanations of those participating in the examination, the results of the questioning of eyewitnesses, and other auxiliary information. The use of a tape-recorder allows the investigator to carry out the examination of the scene of the crime in a more purposeful manner, insofar as he is then not distracted by the need to write up his draft notes. What's more, it enables him to finalise more fully the results of this investigatory activity in the minutes.

The record of the inspection of the scene of the crime consists of three parts: the introduction, the description and the conclusion.

The introduction indicates the place, time and date of the examination, and the conditions in which it was carried out; it enumerates those who participated in the examination and indicates their rights and responsibilities; it also gives references to various articles in the code of criminal procedure, in accordance with which the search was conducted and the minutes collated.

The description contains information about the surroundings, the locality and boundaries of the examined territory or premises, as well as detailed information about all the objects and traces detected during the examination. It shows which scientific and technical resources and methods were used in the detection, initial investigation and fixation of real evidence, as well as the results of such applications.

The conclusion itemises the enclosed plans, diagrams, illustrations, made-up moulds and impressions and other copies of the traces, as well as those objects taken from the scene of the crime; it includes the notes of the observers and other participants in the examination in respect of the way it was conducted, and it details the investigator's decisions taken in response to these notes. Furthermore, it shows that the minutes have been read out to all those who participated in the examination, and finally, it is signed by the investigator, the observers and the other participants of the examination.

The description is defined as complete according to the extent to which the separate objects and traces are linked with the events of the crime. To establish all the circumstances of the scene of the crime with equally full measure is rather difficult, and not in fact necessary. For the purpose of registering, the investigator must take the prospective trial. The circumstances will need to be expressed in the record in such a way so that, according to the description of the scene of the crime, it will be possible to distinctly represent the reality of that scene and, where necessary, to recreate the surroundings thereof.

Generally accepted expressions and terminology is used throughout the description, and each object is referred to by just the one name in all parts of the record. Each successive object or trace is described only after the description of the previous item has been completed. Traces and objects in some way linked are described in sequence so as to give an exact representation of their mutual connections. The use of imprecise expressions is inadmissible ("not far from", "aside" and so on).

Of all the other methods of finalising the results of an examination, the one which is used most frequently is the graphic method: *a set of plans or diagrams of the scene of the crime.* The plan of the scene of the crime is a drawing or a diagram showing the arrangement in horizontal section of the locality, building or structure. This plan is annexed to the record and gives a clear representation of the locality where the examination was performed, and of the relative disposition of the various objects and traces. As a rule, the plan shows just one plane, its top view. If it is necessary to represent certain specific features or traces to be found on the walls or ceiling, then a fold-out plan of the scene of the crime is used.

The objects on the plan and the distances between them are drawn to such a scale so that all necessary objects and traces will be portrayed; objects of a small size, the outlines of which are not shown on the scale of the plan, are represented in small geometrical figures and illustrations by the use of conventional symbols for objects drawn to a different scale. There is a reference on the plan to the fact that it is a supplement to the minutes of the examination. The plan has a key of symbols, the scale, and is signed by the investigator and observers.

If there is no need to keep to a particular scale, a diagram of the scene of the crime will be used. The necessary measurements of the various objects will be shown immediately under them. The precision of the illustration is determined by the purpose of the diagram and the characteristics of the object involved.

Taking *photographs* quickly and clearly records all that was examined on the scene of the crime. With the help of same, the mutual disposition of objects can be established, as can the condition and the character of their specific features. Such photographs are used as illustrations in the record, and thus they supplement same. In a word, they facilitate the more exact explanation of the content of the record of the examination.

When taking such photographs in an examination, it is very necessary, firstly, to do everything in strict sequence and in good time, and secondly, to record both the totality and the details of the objects of the shoot. The first shots are taken during the general observation of the scene of the crime, i. e. when survey and orientation photography is used. In the subsequent stages of the examination, nodal and detailed photography is used to guarantee the full finalisation of the circumstances of the scene of the crime.

The use of photography is referred to in the record of the examination of the scene of the crime. The following details are written down: the object of the photograph, the camera model, the type of the lens, the light conditions, the type and sensitivity of the film, the light-filter and the method used in taking the photograph. In preparing the film prints, some notes are made on the reverse side of each: that it represents such and such object, that it is an enclosure to such and such a section of the record, and that the print was shot from such and such a place on the scene of the crime. The photographs are signed by the investigator, the photographer and by the observers. They may be presented in the form of a photographic collection.

Motion-pictures are taken in the examination of the scene of the crime for exactly the same purposes as photographs. Taking motion-pictures does however facilitate the fixation of objects, not only in the static position, but also in the active mode. Motion-pictures should be taken mainly in those circumstances when it is necessary to establish the dynamics of some process or other; examples are the sequence in fulfilling separate operations, the work of an assembly line, the intensity of a movement, or the various stages of putting out a fire. Motion-pictures of the circumstances of the scene of the crime are especially desirable in those situations when they may change as a consequence of urgent life-saving or restoration operations, or as a result of eliminating the consequences of the crime.

Motion-pictures should be taken by a specialist-cameraman, for in this way, the investigator will not be distracted from carrying out his own special tasks. The minutes must record the fact that such a means was employed, along with certain technical information of the camera and film, as well as a list of those objects taken on the film.

A videotape recording may also be used for the fixation of the results of the examination of the scene of the crime. It means that not only a representation but also a sound commentary of the events may be recorded on the film-tape. For a detailed study of separate parts of the scene of the crime, one can stop the video-film and observe the necessary frame in the static mode.

The use of a video-film is also noted in the minutes. Furthermore, after all the participants in the examination have studied the videotape, they will certify on the end of the tape (in the form of statement of each of them) that it has been correctly compiled.

After the traces and other real evidence have been recorded in the minutes and in the enclosures thereto, preparations are made for their removal from the site. If necessary, the objects and traces will undergo a form of preliminary treatment to make sure the traces are secured and preserved.

In removing the clues, the following rules are observed:

— first of all, necessary measures for the removal of the object, or that part of the object in which the trace was detected, must be undertaken;

— if the object cannot be removed, a copy of the trace should be prepared;

— if several traces have been detected on the scene of the crime and if all have been portrayed by just one and the same object to represent those traces, then for the purposes of copying, it is necessary to choose those objects with the more precise impressions of the object concerned.

In examining the scene of the crime, the investigator removes those objects which serve as real evidence in the case. In removing such real evidence, it is necessary to take all precautionary measures so as not to permit their destruction, damage or alteration.

If such objects for removal are sufficiently robust, they can be taken by edges or some other places where traces suitable for identification could not possibly be found. But if either the object or the traces thereon can be damaged, or if some fingerprints can be left on them, then rubber gloves and pincers should be used during their removal. The inspection and wrapping of such items should be performed on a table covered with dry oilcloth or PVC film.

It is necessary to observe especial care when working with microparticles and microtraces the sort which might be found either on movable objects (clothes, shoes and weapons, etc.), and/or on unmovable ones (floors, a part of the locality of the crime, and so on). In removing such objects on which there may be traces, one must not shake or clean them or, indeed, do anything which might cause, either some micro-traces to be lost or some objects to come into contact with separate ones on which other microtraces may lie. Furthermore, such objects should not be allowed to come into contact with other extraneous items.

Every "trace-carrying-object" is packed separately in a plastic bag and fixed so that it cannot move about; in this way, during transportation, the original position of everything is maintained and all microtraces preserved. Clothes and footware are packed in such a way so as to prevent both the contact of different surfaces, and the possible transfer of microparticles from the surface of one object to that of another. Items in/on which microparticles and microtraces have been detected may be marked by stitches of thread or covered with patches of sewn material which neither foul nor absorb them.

In the removal of microparticles from unmovable objects, pincers, needles, scalpels, magnets and fingerprint film are used. Where necessary, separate scrapings are taken of those objects from which microtraces have been removed. To carry out such a task on a large surface (e. g., inside a motor car, etc.) it is possible to use special "dust-detectors".

To preserve the evidence, and to guarantee the preservation thereof, the packing material must be sufficiently robust so as not to deform its contents during transportation. Plywood and cardboard boxes, glass retorts and test-tubes, paper and film are all used as packing materials. The wrapped objects are secured so that the trace-bearing surfaces do not come into contact with the packing materials. Cross-bars, extension wires and frames can all be used for this purpose, as indeed can other methods of strengthening. For brittle items, cotton wool and paper padding are used.

In order to preserve certain items of real evidence, it might be necessary, first, to subject them to a preliminary treatment by using preservatives and other special means for their protection. The investigator can always get help and necessary advice in this regard from the appropriate specialists. For example, blood-stained materials and pieces of gauze onto which blood spots have been taken must all be thoroughly dried. If this is not done, if instead the blood is submitted to long periods of moisture, then it simply decays and becomes unfit for the purposes of its examination.

For the removal of real evidence, every item is, as a rule, packed separately. Either on the parcel itself or on a label attached thereto, the following is recorded: the name of the object, the place from which it was removed, the date of its removal, the number of the criminal case concerned, and the title of the minutes to which the given object is enclosed. When all is done, the label is signed by the investigator and the specially invited witnesses.

CHAPTER XVII

TACTICS OF THE INVESTIGATORY EXPERIMENT

1. The Aims and Stipulations for the Conduct of an Investigatory Experiment

In the course of an investigation of a crime, it is often necessary to verify the relevant circumstances — i. e., anything which might be of significance for the case in question — by means of an experiment. Such circumstances include the following:

— could a witness have seen the criminal, listened to the conversation, or heard the crack of the shot fired?

— in what conditions could someone penetrate through a gap detected on the scene of the crime and then take away certain objects?

These circumstances are ascertained in the course of *an investigatory experiment*. It is conducted to verify and amplify information relevant to the case concerned, and is realised, firstly, by recreating the actions and circumstances or other conditions of a definite, known event, and secondly, by performing the necessary experimental acts concerned. In such a way, the essence of the investigatory experiment is to create a real model of the supposed situation, and then to conduct the corresponding experiments in this special, recreated situation.

An investigatory experiment is widely used in the investigation of the crime, both as a means of verifying evidence of the case, and of collecting new evidence. The aim also includes the verification of theories of the crime. Apart from having a significance in the form of direct evidence, the obvious results of investigatory experiments may prompt those who deliberately gave false evidence to change their behaviour. Results of investigatory experiments are also used for the purposes of preventing crime: for in the conduct of such experiments, it may be possible to identify both the reasons for, and the circumstances which facilitated, the execution of the crime. On this account, one can identify specific measures to eliminate such circumstances.

In the course of an investigation, the investigator is obliged to undertake various experiments. In practice these include, in particular, the following:

— experiments to define the possibility of perceiving by a person of some fact or phenomena. As a rule, this is the verification in certain distinct conditions of the possibility of seeing this or that object, of hearing definite sounds, or of catching human speech;

— experiments to establish whether or not it is possible to execute certain actions. In conducting these, the investigator usually poses one of the following tasks: was the person able to undertake such an action, and was it feasible for the said person to complete that action in definite circumstances? More often than not, such experiments are conducted in order to confirm whether or not it is possible to penetrate or to pass an object through this or that aperture or barrier, and to go or run over the corresponding distance in the specific period of time and so on.

Professional and other skills of an offender are verified in these experiments, for instance, his skills as a driver, metal-worker and cobbler:

— experiments to identify the possibility of whether or not an actual fact could exist, and whether or not in the manner defined an event could indeed take place. During the course of these experiments, the investigator tries to establish whether or not such an event, information of which was given by the accused or other persons, actually could take place. (For example, if it is possible to place in the body of a car a particular number of boxes.) Furthermore, such experiments are able to demonstrate whether or not the events took place in the way the interrogated person described.

In order to conduct an investigatory experiment, it is necessary to observe the following conditions which guarantee:

— the admissibility of the adopted procedure (the extent to which it is possible to use the experiment in an investigation), and

— the authenticity of the experiment's results. A second group of conditions are, essentially, the tactical methods applied with due regard for the particular circumstances, and are designed to guarantee the greatest possible success in the conduct of the investigatory experiment.

The Conditions Guaranteeing the Admissibility of the Investigatory Experiment. The given investigatory activity provides for the recreation of certain circumstances connected with the investigated crime. To repeat the actual deeds of the crime is of course inadmissible, for that would mean the commitment of a new offence. In an investigatory experiment, only separate circumstances of the crime under investigation may be recreated. The recreation of actions, circumstances and other conditions of the event under investigation, or the execution of necessary experiments is admissible, only if they do not contradict the principles of legality. The law of criminal procedure allows an investigatory experiment to be conducted only in those conditions which do not degrade the dignity and honour of those persons participating in same and of other persons on the scene of the experiment, and if the experiment does not endanger their health. It is not allowed to carry out an investigatory experiment if it might lead to an infringement of the public order, or when it might cause real damage to the interests of the state and/or individual citizens, or if it might entail excessively large material losses and/or serious difficulties in the work of enterprises, institutions and organisations, or serious traffic disruption.

The Conditions Guaranteeing the Authenticity of an Investigatory Experiment. The authenticity of the results of an investigatory experiment is guaranteed by the conduct thereof in conditions similar to those in which the verified event took place, and also by the frequency and variety of the experiments. The frequency and variety of the experiments are necessary to confirm that the results are not accidental, rather that they follow a regular pattern. And the observation of the conditions guarantees that the results received in the experiment correspond to the real results of the verified situation.

In accordance with the type and character of each particular investigatory experiment involved, the following necessary conditions may apply:

(1) the experiment should be conducted in the same place where the event being verified took place, and in the same or similar conditions;

(2) it should be conducted in similar meteorological conditions—temperature, humidity, wind speed and direction, precipitation, etc.;

(3) in similar light conditions, and with a similar background noise level made up of noise sources of similar magnitude, disposition and orientation;

(4) furthermore, in conducting the experiment, use should be made of original or similar objects, instruments, etc.;

(5) those who participate should include those whose evidence is to be verified; and finally,

(6) the experiment should be conducted at the same tempo at which the events under verification did proceed.

If not observed, the above conditions of the experiment may affect the results thereof. Thus, if the purpose of a particular experiment is the identification of the possibility for a certain object to be visible in certain circumstances, then it will be necessary to conduct this experiment in similar circumstances, having first ensured the existence of realistic conditions which might help or hinder such an observation. The time at which such an experiment is conducted, the meteorological conditions and lighting may all affect the authenticity of the results. The objects to be observed during the experiment should also be analogous to those which were a part of the event under verification, and they should be disposed in just the same positions. Furthermore, the observation of the experiment should be performed from the same place where the eyewitnesses observed the event in a real situation.

In conducting other experiments, for example, in trying to establish whether or not it is possible to penetrate a certain aperture, meteorological conditions and the prevailing visibility are of no essential significance. Those who actually perform the corresponding experimental task, can also be substituted. An experiment to identify the skills of a particular person, however, should be performed only with the participation of that individual, but other factors — in particular, the place in which it is carried out — may have no effect on the results.

Thus, to guarantee the authenticity of the results of an investigatory experiment, it is necessary to achieve the maximum similarity between those experimental conditions which might affect the results, and those of the event under verification.

The authenticity of the results is also guaranteed by the frequency and variety of such investigatory experiments. In conducting an investigatory experiment, the one and the same test should be repeated a few times; meanwhile, the conditions thereof should be kept constant. This is done to achieve a more thorough understanding of the event under verification, and also to exclude the appearance of any accidental elements in the results of these tests. The consistency of the results achieved during the repeated conduct of one and the same test confirms their regular nature.

In order to explain the conditions in which this or that result may be achieved, the experiment is conducted in various ways, i. e., the one and the same test is performed several times, and on each occasion one of the conditions is altered. The necessity of this usually occurs when there is not any exact information about the circumstances or conditions in which the verified event took place, or when it is impossible to recreate the details thereof. Materials, instruments, lighting, relative distances, all may be altered, as too can be the means by which this or that test is performed. One must, of course, change only one factor at any one time so as to know for sure that it was just that factor which so influenced the results of the experiment. The conditions of the various tests may be simplified or made more complex. Getting a positive result in more complex conditions may suggest such a result could also be achieved in simplified conditions; but if, on the other hand, a positive result is not achieved in simplified conditions then it would be hard to expect such a result in more complex ones. If, for example, a whispered phrase was audible in certain conditions, then it can be assumed that the same phrase spoken with a normal or loud voice would also be audible. And if a phrase spoken with a loud voice is not audible in the experiment, then one cannot expect a whisper to be heard in similar conditions.

The Participants of an Investigatory Experiment. The question of who takes part in an experiment depends on the type and the content thereof. The investigator and the witnesses specially invited to experiment, however, must participate.

The investigator carries out all the preparatory work, plans the conduct of the experiment, resolves procedural and organisational questions, plays a direct part in performing the experiment, gets acquainted with its results, and finally, writes up the minutes. When, in the course of an experiment, the participants are kept apart from each other, the investigator may be helped by a professional colleague.

Besides the general demands required of the witnesses, those of them who are called to watch the conduct of the investigatory experiment will need to understand the thought behind, and the content of, those tests which are to be performed during the experiment. In conducting simultaneous tests in several places, at least two witnesses are required to be present at each.

In reconstructing the circumstances and exact conditions of the crime, it might be useful to involve the participation of the suspect, the accused, the victim or eyewitness whose evidence is verified in the course of the experiment. They participate in the investigatory experiment when it is necessary to verify certain personal characteristics without which it is impossible to carry out the relevant tests. The necessity of their involvement in the experiment may also be explained by certain tactical considerations.

Subsidiary participants may also play a role in the conduct of tests in the experiment. The number thereof and their various functions will be defined by the investigator, depending on the type of experiment and the content of the tests. If they take the place of the original participants of the verified event, then they should possess similar characteristics, for otherwise the results of the experiment may turn out not to be authentic.

A specialist may be invited to participate in the conduct of an investigatory experiment. He may give essential assistance to the investigator in the planning and preparation of the experiment and, during the various tests, he may directly help to finalise and evaluate the results. The assistance of a specialist should be sought on those occasions when, in the conduct of an investigatory experiment, it is necessary to observe certain safety measures.

2. The Preparation and Tactical Methods of an Investigatory Experiment

To conduct an investigatory experiment properly, a thorough preparation is required, one which includes decisions as to the setting up, planning and completion of the activities prepared.

If in the evaluation of information collected on the case it becomes evident that a certain circumstance is of essential importance for the case but requires verification, then the necessity of setting up an investigatory experiment may arise. Before deciding how to set up an investigatory experiment, it is necessary to answer the following questions:

— what particular event or fact needs verification, and what it means for the investigation;

— whether it is possible to establish this fact or event by conducting the investigatory experiment, or other procedural activities are required (e. g., to appoint a commission of experts);

— which measures are necessary for the experiment, and what possibilities are there for the practical realisation of same;

— and in setting up the investigatory experiment, whether it is possible to create such conditions as will guarantee the admissibility and authenticity of the results.

To resolve the above questions, detailed information is needed about the conditions in which the examined event took place, and to receive supplementary information, interrogations and other investigatory activities may be conducted.

If it is necessary to carry out the investigatory experiment on the scene of the original crime, the investigator must acquaint himself with the scene beforehand. This will help him resolve the question of the possibility and purposefulness of carrying out the given investigatory activity, and establish a more detailed plan of the experiment. Finally, to decide how the investigatory experiment will be conducted in specific conditions (during the investigation of an infringement of labour protection rules or of a traffic transgression, and so on), it will be necessary to study the corresponding rules and regulations, and as required to consult with specialists. All of this helps the investigator to thoroughly analyse the circumstances of the accident, to plan the character of the proposed tests and to present the possible results.

Having decided to set up an investigatory experiment, the investigator works out a plan for its conducting. When the preparatory work and the tests are expected to be more or less complicated, a detailed plan for their fulfilment is elaborated in written form. The plan must in any case provide for the following:

(1) the content and the purpose of the experiment as a whole, and of the various stages and separate tests, their number and their sequence;

(2) the time and place of the experiment to be performed;

(3) the measures undertaken for the purposes of reconstructing the relevant circumstances;

(4) other measures initiated in order to create those conditions which will guarantee the admissibility of the experiment and the authenticity of the results;

(5) the objects required for the experiment;

(6) the methods of finalising the results, and the necessary scientific and technical means; and finally,

(7) a list of the participants.

The investigator's preparations for the investigatory experiment are most clearly apparent in his reconstruction of the circumstances of the crime. In accordance with the investigator's information, the relevant objects are disposed just as they were at the moment when the event being verified took place. Accordingly, he must take into account the fact that, in setting up the investigatory experiment, the original real evidence may be damaged or even destroyed. For this reason, they should be replaced by substitutes. Models, plaster casts and other replacements may be used. A substitute which is similar to the original is admissible if the differences between the substitute and the original do not affect the results of the experiment.

The investigator must take care to ensure that all the participants in the experiment are in the right place and at the right time, and he must look after the supply of scientific and technical means and other items necessary for the setting up of the experiment.

The investigator will verify whether the circumstances and conditions on the scene of the experiment correspond to those which existed at the time when the event under investigation took place. Furthermore, he ensures that all necessary items for the conduct of the tests are at hand. If it is established that something does not correspond as it should, and that, what is more, it may affect the results of the tests, then that item will be eliminated. The readiness of the scientific and technical means is confirmed. The investigator also makes sure that all participants in the experiment are present; he explains to them their rights and responsibilities; warns them not to divulge information about the content or results of the tests; informs them within the necessary limits about the content of proposed tests; and finally, he informs each participant of his role.

In acquainting the participants with the purpose and the tasks of the investigatory experiment, the investigator asks them to take into account the fact that their perception of one or another circumstance in the adapted conditions might substantially differ from the perception of the analogous circumstances in the original conditions. It is well known that a person's frame of mind and readiness to perceive a defined circumstance actually affect that person's perception of an actual event. An uninhibited perception is distinctly more productive than its opposite. In taking this into account, the participants of the investigatory experiment, on whom, of course, the results of the tests so depend, will only be informed of that which is necessary for the completion of the tasks assigned to them; in this way, they will not concentrate their minds on some anticipated circumstance.

Each participant is to be informed as to where he should be during the conduct of the experiment; what actions he must undertake; when, in what sequence and according to what signal he must so act; to what he must pay attention, and so on.

Before initiating the tests, the investigator must make sure that all necessary safety measures have been taken.

When all preparatory measures have been completed, the participants take up their places. The investigator ascertains that all is ready, and then indicates the start of the tests. At his signal, the participants undertake their stipulated tasks. If separate parts of the experiment need to be conducted in different places, then the tests will start at the time agreed upon beforehand. The investigator ensures that the participants carry out their duties correctly and in accordance with the plan; if they do not act in the appropriate manner, he stops them. In this case, the investigator will again explain to the participants what they must do, and the experiment will start again from the beginning.

Where necessary, the experiment is conducted in several stages. This enables the participants more easily to perceive the content of the experiment, and more correctly to evaluate its results. The quantity and the variety of the tests are planned beforehand, but the plan can always be amended in the course of the experiment. Thus, at the request of the person whose evidence is to be verified, the investigator may permit the repetition of the test in the form suggested by the person.

3. The Recording of the Conditions and Results of an Investigatory Experiment

The way in which the investigatory experiment was performed is contained in the minutes. Besides general information, the minutes of the investigatory experiment indicate both the reasons for it and its purpose. The minutes should contain a detailed description of the conditions and circumstances in which the experiment was conducted and whether they corresponded to those wherein the event under verification took place. Accordingly, they must contain references to the sources from which information as to the original circumstances and conditions of the crime was received. If such information is the evidence of one of the participants in the experiment, then the minutes must include the relevant part of his statement. The minutes also indicate which objects of the original scene have been replaced by substitutes for the purposes of the experiment.

In the description of the investigatory experiment, the following information is set forth in detail: the disposition of the participants prior to the start of the experiment, the content of each test, and the obtained results. If the conditions of the conduct of the experiment change, then their nature is recorded, and the results obtained in these altered conditions are listed.

Photographs and motion-pictures, videotapes, diagrams and plans are used as auxiliary means of recording results. Photographs clearly portray the conditions and circumstances in which the experiment was carried out; furthermore, they show the external form of the separate objects, and the disposition of the participants during the various stages of the experiment. If, in carrying out an investigatory experiment, it is necessary to show a particular event in dynamics, then motion-pictures and/or a video-recording would be more effective. Plans and diagrams act as illustrations to the minutes when it is necessary to portray graphically the scene and the disposition of the participants in the experiment.

During the evaluation of the results of an investigatory experiment, their authenticity (truthfulness) and evidential value are determined. Only the authentic results of an investigatory experiment may be used as evidence in the criminal case. The evaluation of their authenticity actually consists, firstly, in the verification of whether the investigatory experiment was conducted correctly; and secondly, in the observation of the tactical rules required for performing this investigatory activity.

To evaluate the authenticity of the results of an investigatory experiment, it is first of all vital to ensure that the conditions and circumstances of the experiment correspond to those in which the event under investigation took place. Basically, these conditions and circumstances must be the same. If certain particular details of the situation do not coincide with those of the earlier event, then the investigator must explain whether or not this might affect the results and if so, how. If the evaluation of the circumstances and conditions is positive, then this may give grounds for the conclusion that the results of the experiment are just as would have been achieved in the situation being verified. If significant divergencies are established, then one can conclude, insofar as it will not be possible to judge from the results how the actual event took place, that the experiment has not achieved its goal.

In evaluating the authenticity of an investigatory experiment, the synonymous results of a repeated test are of great significance. In this way, the possibility is excluded of some accidental factor influencing the results. If in the repetition of tests different results are achieved, then these divergencies must be explained; unless this is done, not one of the results may be regarded as authentic, nor may it be used as evidence. If the results of the tests performed in more complicated conditions turn out to be positive, this testifies to their authentic nature.

In evaluating the results of an investigatory experiment carried out to verify the subjective qualities (abilities) of a particular individual, those factors which may influence the psychology of the person concerned must be studied and taken into account.

The evidential value of the results of an investigatory experiment is determined during the examination of these and other pieces of evidence collected in the case.

As a rule, negative and positive results of an investigatory experiment play a different role in presenting proof. Negative results (such and such cannot be seen, heard, done, etc.) categorically demonstrate that without doubt the verified event could not have taken place in the given conditions. Positive results only serve to show that the given event might have taken place. Thus, having shown that a key taken from the suspect could not open the door of the victim's room, such a negative result of an experiment demonstrates clearly that this particular lock could not be opened by this particular key. If however, the experiment does establish that the given key can open this lock, this is still an insufficient basis for concluding that the given key was used with criminal intent. The positive result allows us only to suppose that the criminal might have opened the lock with the given key.

CHAPTER XVIII

TACTICS FOR THE VERIFICATION OF EVIDENCE *IN SITU*

1. The Cognitive Function of a Verification of Evidence *in Situ*

The verification of evidence in situ is an investigatory activity which is characterised by its special procedural nature; furthermore, it has its own cognitive function. By several criteria, it is similar to an inspection of the scene of the crime undertaken not only with the participation of the accused, the accused and/or the victim; but also with an interrogation on the scene of the crime required for the identification of parts of the locality; and also with an investigatory experiment conducted with the participation of those whose evidence is to be verified. These activities, however, cannot be used instead of the verification of evidence *in situ* as the procedural means of proof.

With a view to checking and verifying the evidence of a suspect, accused, victim or witness in relation to a particular locality, the investigator has the right, in the presence of the specially invited witnesses, or, when necessary, accompanied by a specialist, to arrive, along with the interrogated person in the place indicated by the latter during his questioning, and suggest he should point out the pertinent conditions, circumstances and objects of that area. In so doing, the person whose evidence is to be confirmed or specified indicates the path to that place, as well as the circumstances, the situation and the objects about which he had given evidence earlier; in addition, he will answer the investigator's questions connected with the verification and clarification of such evidence.

That place is usually the place where the crime was prepared and executed, where traces and instruments of the crime were covered up, and where the criminal and his accomplices hid themselves.

The verification of evidence *in situ* plays a cognitive role, because as a result of such an investigatory activity, the investigator receives new information which demonstrates the authenticity or the considerable probability of the truthfulness or otherwise of the evidence being verified. Such information is received by comparing the explanations of the person interrogated with the reality of the situation *in situ*. The evidential value of such information is determined by taking into account the results of the earlier investigatory inspection at the place indicated.

Of course, factual information contained in the evidence of a witness, victim or accused, may be verified by other procedural means such as an inspection, a search, a collection of letters, an investigatory experiment, an expert examination and other investigatory activities. The verification of evidence *in situ*, performed as an investigatory activity, is a procedural means of verifying evidence. The comparison of the evidence of a person interrogated, both with the real circumstances on the scene of the crime, and with the results of its earlier examination, are characteristic of the verification of evidence *in situ*.

New information received as a result of the verification of evidence *in situ* is characterised by the relationship of other data received from four different sources. The first source is the information contained in the verified evidence; the second is that which was part of the person's explanations on the scene; the third source is that information emanating from the real circumstances on the scene and their links with the conditions in which the crime was committed; and the fourth source is the information obtained as a result of the earlier inspection of the said scene. The first and last sources are beyond the limits of the verification of the evidence *in situ*, but they are nevertheless used in evaluating its results. The material received from the four sources can totally coincide; and in this case, it is possible to reckon with a large degree of certainty that the verified evidence corresponds to the reality.

Information from the first two sets of sources may not coincide either by volume or by content: such cases occur when the person interrogated gives information at considerable variance from the evidence he presented at an earlier stage. This may be explained by the following reasons:

(1) the person interrogated was not acquainted with the actual circumstances on the scene and during the interroga-

tion he gave false testimony which therefore did not correspond to those circumstances; then, during the verification *in situ*, and under the influence of such obvious disparity, he changed his evidence. In such cases, the person interrogated is often unable even to point out that place which he mentioned during the interrogation. Investigatory experience confirms the fact that the circumstances on the scene have an especially strong psychological influence on the person who has already given false evidence. Blatant disparities between his evidence and the actual circumstances *in situ* force him to renounce his earlier pronouncements and to give correct evidence. In such a way, the verification of evidence *in situ* plays an important role in the exposure of the false self-incrimination of the accused and of the false evidence of witnesses.

(2) the person interrogated gave a correct, but indefinite and even somewhat contradictory evidence about the circumstances on the scene, simply because he forgot certain facts and conditions; but, having seen that place again, this time as a participant in the verification of evidence, he recalls the exact details of the circumstances, and remembers the various objects and their links with the circumstances of the crime being investigated; therefore, he changes his testimony somewhat by supplementing it with more definite explanations and eliminating the inherent contradictions. In similar cases, the very circumstances of the scene and the demonstration of the various actions by the interrogated person during the course of the verification of evidence *in situ* can facilitate the invigoration of his memory, can renew his recollections, and can eliminate the contradictions and inaccuracies of his previous testimony;

(3) when the time came for the verification of the evidence *in situ*, the person interrogated decided to change his true evidence given earlier, and in the course of the verification, he gave testimony which contradicted both his earlier evidence and the real circumstances on the scene. In such cases (which are very rarely met in practice), it is difficult for the interrogated person to find persuasive arguments which could then explain why the circumstances on the scene corresponded with his earlier evidence which only now, in the course of verifying same, he has changed. As a rule, in searching for such arguments, the interrogated person becomes convinced of the folly of the tricks he has initiated, and so he starts to give relatively correct explanations of the circumstances on the scene and of their links with the circumstances of the event being

verified.

The correlation of the enumerated sources of information may also be characterised by the fact that the explanations of the interrogated person on the scene coincide with his previous evidence given during the interrogation, but in both cases they do not correspond to the actual circumstances on the scene of the event being verified. There may be two reasons for this. Firstly, both the explanations of the interrogated person on the scene and his previous evidence were lies, and therefore they did not agree with the actual circumstances. The second reason is as follows: the evidence given under interrogation and the explanations of the interrogated person given during the course of the verification of this evidence *in situ* are correct, but they do not coincide with the real circumstances because the latter, after the crime was committed, sometimes changed beyond recognition. In similar cases, the interrogated person in his explanations reconstructs in his mind (or better still, with the use of plaster casts, pictures and walks-on) the relevant scene; in this way, he may show the previous disposition of the various objects, demonstrate particular actions and explain the link between these and the circumstances of the event being verified. In these cases, the comparison of the explanations of the interrogated person with the results of the examination carried out earlier on the scene are of especial importance. Their full and detailed adequacy confirms the truth of the evidence being verified.

If the explanations of the interrogated person at the site and his previous evidence given in the interrogation do not correspond to the actual circumstances on the scene and contradict the results of the inspection carried out earlier, then the conclusion of the inauthenticity of the evidence will inevitably arise. And when all four sources of information do not agree with each other, such a conclusion about the inauthenticity of the evidence being verified becomes all the more certain.

The purpose of a verification of testimony *in situ* is evident in the very name of this investigatory action: the verification of testimony. The study of the circumstances on the scene of the crime, the detection and removal of traces of the crime and other items of real evidence do not relate to a cognitive function in the verification of evidence *in situ*, because this is the task of a different investigatory activity, i. e., the inspection of the scene of the crime. But if in the course of the verification of evidence, the interrogated person points out the places in which are situated such as yet undiscovered items as the weapon of the crime, stolen property and/or the corpse, then in addition to a verification of evidence, an examination of those places wherein these pieces of real evidence were found must also be carried out. To combine both the cognitive function of verifying evidence *in situ* and the examination of the scene of the crime, with the participation of the interrogated person included therein, is inadmissible. Obtaining new evidence from the interrogated person should not be part of the cognitive function of the given investigatory activity, for such is a function of the interrogation. By separate criteria, the interrogations of the suspect and the accused, of the victim and the witness on the scene of the crime are similar to those verifications of evidence which involve their participation, but these are different investigatory activities characterised by their different cognitive functions, and to substitute one for the other would be unlawful.

As a rule, the verification of evidence *in situ* is carried out after the site concerned has been thoroughly examined by the investigator without the participation of an interrogated person (although with the latter's evidence taken into account). A comparison of the results of the verification of the evidence *in situ* with the results of the examination carried out earlier enables the investigator to evaluate the explanations of the interrogated person correctly.

2. The Preparation of a Verification of Evidence *in Situ*

A verification of evidence *in situ* may only be carried out in certain definite conditions. The following are required: the person's detailed evidence relating to the particular scene and his agreement to participate in the verification of his evidence.

Furthermore, as has already been noted, another necessary condition is the examination of the said place without the participation of the interrogated person. In connection with this, the following question sometimes arises: should one not prefer an examination of the site with the participation of the interrogated person to a verification of evidence *in situ*? Thus, if the accused testifies to the fact that he hid certain objects and the weapons of the crime in a particular place (for example, in a forest) and, what is more, that he can indicate the whereabouts of this place, then the investigator will be confronted with a task: either to immediately carry out an examination of the said place with the participation of the accused (then the subsequent verification of the evidence makes little sense) or to carry out an examination of the place indicated without the accused's participation, and then to carry out the verification of evidence *in situ*. But in that case, a considerable amount of time will be lost in the search for real evidence and, moreover, without the assistance of the interrogated person, the investigator may not detect all the objects and traces and, as a result, individual pieces of real evidence will be lost. In such a way, it would seem at first glance more preferable to carry out an immediate inspection with the participation of the interrogated person. However, in relation to documentary proof, such a decision is less expedient, and not only because in a similar case an additional source of evidence may be lost and unusable — i. e., the verification of evidence *in situ* — even though this factor is always important. The effect of psychological factors must also be taken into account. It is more difficult and sometimes even impossible, carrying out the examination of a scene with the participation of the interrogated person, to verify whether or not the said person was a participant in the crime or whether, having heard from others about what took place, he then decided to "take it all upon himself" and, in so doing, try to shield the original guilty parties. This is explained by the fact that in the examination with the participation of the interrogated person, the very objects and traces on the scene of the crime may "lead" the interrogated person to a certain place even though he himself was never there and only heard about it from others. The way the interrogated person points out such objects and traces will clearly persuade the participants in the examination of the "truthfulness" of his evidence, and it is often very difficult to confirm this subsequently. But if, from the scene where the verification of evidence is carried out, objects and traces were removed earlier — i. e., during the examination without the participation of the interrogated person — and if this same person still continues to indicate the exact places where those items had been situated (without the repeated visual perception in the conduct of a verification of evidence *in situ*), then the conviction in the truth of his evidence will increase considerably. In the first case the interrogated person's attention is attracted towards these objects and traces by their very presence while in the second instance, without any visual reminders of the objects and traces, he goes straight to where they had earlier been laid.

Therefore, difficulties as may occur in the search for objects and traces without the help of the interrogated person should not prompt the investigator immediately to conduct an examination with the former's participation. He should remember the additional and demonstrative value of that information which can be obtained in the verification of evidence *in situ*. To scorn such a source of proof and to immediately conduct an examination with the participation of the interrogated person is possible, but only in those cases when the examination has not given precise indications as to the whereabouts of these objects and traces, and when, without the person's participation, it would be impossible to find them.

The content of the evidence given by a person under interrogation must be taken into account when deciding the possibility and expediency of conducting an investigation of evidence *in situ*. It is inexpedient to initiate an investigation if the evidence is imprecise, abstract, and not connected to any great extent with the circumstances on the scene of the event being verified. In examining the scene of the crime, the investigator must bear in mind that in the subsequent investigatory proceedings, it may be necessary on the said scene to conduct verification of the evidence of the accused, the victim or the witness. With this idea in mind, the investigator should record the circumstances on the scene of the crime in more precise detail, indicating exactly in the plans and diagrams of the minutes the locality and the relative dispositions not only of the traces and such like real evidence, but also of the whereabouts of other (extraneous) items which might draw the attention of the participants or eyewitnesses of the crime and help to prompt their memories. In taking orientation photographs (or motion-pictures) of the scene of the crime and the approaches thereto, it is important to choose the most suitable reference points; these can then be used as bearings in the verification of evidence. A more detailed perspective of the scene of the crime is also needed for a more exact and correct evaluation of the results obtained in comparing the information given by the person interrogated during the verification of his evidence with the results of the examination carried out earlier.

If the circumstances on the scene of the crime are recorded not in sufficient detail during the examination, then before carrying out the verification of evidence, it is expedient for the investigator to visit the scene so as to acquaint himself with it, so as to determine the possible reference points and so as to make a preliminary plan of those points from which the photographs and motion-pictures will be taken, videorecordings made. A preparatory familiarisation with the scene of the proposed verification of evidence is also necessary for another reason: the investigator must verify whether or not any changes have taken place on the scene. Such might include the consequences of building and reconstruction work, or the demolition of other structures. Furthermore, he must know if it is possible in the given conditions to carry out the investigatory activity as ordered.

In addition to the above, in preparing the investigation of evidence it is necessary:

— to repeat the interrogation of the accused, the victim or the witness, if their evidence is too general. The repetition must serve to consolidate more detailed information about the conditions and the objects on the scene of the forthcoming verification, to confirm the approaches thereto, and to determine the basic reference points. For the purposes of interrogation, the use of the following is recommended: topographical maps, plans and models of the locality. It is expedient to offer the person under interrogation to draw from memory a design of the scene of the forthcoming verification of evidence; this plan should show the disposition of objects, the rendezvous points of the criminals, the places where different episodes of the crime took place, and so on. During the repeated interrogation of a person whose evidence is shortly to be verified on the scene, the investigator should ascertain whether or not he can precisely reproduce a "route-map" and a "survey-map" (two types of topographical presentation), and whether he can find his bearings on the scene while returning to that particular route. All of this is important for the correct evaluation of the results of evidence given *in situ*;

— to plan the time (the day and the hour) at which the given investigatory activity will be carried out;

— to prepare the corresponding apparatus, transport and auxiliary means (dummies, stencils, models of the objects, etc.) necessary for the successful production of a verification of evidence *in situ*. In carrying out the said investigatory activity, the following scientific and technical means may be used: photo, tape and video cameras;

— to determine who will be the participants in the verification of evidence *in situ*. Besides the investigator and the person whose evidence is to be verified, the participants of such an investigatory activity should include the specially invited witnesses: a specialist (more often than not a cameraman or a photographer, but also a video- and sound-camera operator), and auxiliary personnel assigned to guard the accused and guarantee appropriate order;

— to brief the participants of this investigatory activity, to explain to them the purpose and the order of the forthcoming verification of evidence *in situ*, and to explain their rights and responsibilities. In the presence of the specially invited witnesses, the investigator will explain to the person whose evidence is to be verified that his presence in this activity is voluntary, and that he will be asked to indicate the route to the scene of the verified event, the circumstances and particular objects on the scene, and their links with the event being verified. The investigator will point out to the witnesses their rights and responsibilities; furthermore, he will explain to them that in witnessing the facts, the content and the results of the verification of evidence *in situ*, they must pay attention to the voluntary and independent nature of the activities of the interrogated person; hints and promptings to him by the participants in the investigatory activity are inadmissible; they must be objective and exact in finalising the conduct and the results of the verification of evidence *in situ* in the record. The investigator should agree in advance to a system of signals with the film- and video-operators; such will be used for starting and stopping film/video shots. The investigator usually carries out the briefing in his office, but it can be conducted on site if he calls for a meeting of the participants of the investigatory activity to be held in advance;

— to plan the point at which he must start the verification of evidence. It does not always correspond to the place where the preliminary investigation was carried out; rather, it is determined by taking into account the content of the evidence to be verified and the particular conditions of the locality. The verification of evidence *in situ* must always start from a point somewhat removed from same, in order to make sure that in the process of verifying the evidence, the interrogated person both knows and is able to point out the path thereto. The question of where to start the verification of evidence must be resolved with the participation of the person whose evidence is to be verified. The plan of a proposed verification of evidence *in situ* must be well thought out in every detail and, where necessary, presented in written form.

3. Psychological and Tactical Particularities of a Verification of Evidence *in Situ*

After the preparatory measures have been initiated and the participants in the investigatory activity have arrived at the point from which it is planned to start the verification of evidence, the investigator asks the interrogated person to indicate the path to the scene of the crime, and the entire group will then follow this particular track. In so doing, the interrogated person should walk in front and independently of the others, so as to indicate the way; at the same time, he should draw the attention of the other participants to those conspicuous reference points of the locality which are linked in some way with the circumstances of the crime. An example of the latter is the rendezvous point of the accomplices in crime immediately prior to the commission of the crime; another is the place where the criminal awaited his victim or carried out some other preparatory deeds; yet another is the place where he buried the weapon of the crime, and so on. While on the scene of the crime, the interrogated person points out its general boundaries, the sectors in which separate episodes of the crime took place, the situation on the scene, and the circumstances and the objects about which he gave evidence earlier; in addition, he indicates their connections with the event under review, he points out the changes which took place in the circumstances on the scene and in relation to disposition of the objects, and he itemises those objects and traces which are no longer present on the scene. The investigator may ask the person whose evidence is to be verified, to demonstrate his own particular part in the action carried out at the time of the event now under investigation, and to recreate — with the help of models, stencils and dummies prepared earlier — the previous circumstances on the scene. For example, he could be asked to show the position of the corpse, the hiding place of the weapons of the crime, stolen property, and other objects and traces of the crime (already detected and removed from the scene of the crime in their own due time during the examination). All of this must be thoroughly finalised. In recreating the circumstances of the scene of the crime and the previous disposition of the objects, the interrogated person must embrace the changes introduced into the scene, not only during the conduct of its examination (changes caused by the removal of detected objects and traces), but also those which took place after the examination. The circumstances should be recreated in the most detailed way possible, for the degree of detail is a persuasive demonstration of the interrogated person's knowledge of the particular circumstances of the crime under investigation.

During the verification of evidence *in situ* the interrogated person may be asked further questions. Such questions may concern the following:

— the particular aspects and details of the scene;

— the changes which have taken place therein;

— the various particular objects and their connection with the circumstances of the crime under investigation;

— the reasons why the information of the interrogated person given on the scene does not correspond to testimony given earlier;

— the cause of the disparity between his own evidence and the actual circumstances, and also

— other information connected with the scene where the verification of evidence is being conducted. All explanations are written down in the record.

In a number of instances, the scene of the verification may include several positions somewhat removed one from another: the place where the criminals prepared their criminal deed, the place where the crime was committed, the places where separate criminal episodes were carried out, where objects and the weapons of the crime were hidden, etc. In such cases, the verification of evidence should be conducted in just the same sequence as was the crime under review, and all those various places referred to by the interrogated person should be included.

In those instances when it is necessary to conduct a verification of evidence with several interrogated persons, though all in one and the same place, then each should be carried out separately; a multiple verification of evidence with the simultaneous participation of two or more interrogated persons is inadmissible.

During the verification of evidence *in situ* special attention must be given to see to it that all persons whose evidence is to be verified are able to act independently, without any hints or promptings from other participants in the investigatory activity; furthermore, leading questions and the amendments of the investigator must be excluded. As an important tactical matter, the investigator is recommended not to hurry with a negative evaluation of those explanations and information given by the interrogated person earlier which do not correspond to the actual circumstances on the scene, since they may be the result not only of giving false evidence but also of the incomplete perception of the locality in the memory of that person.

In an external description of the various parts of the locality, of the scene itself and of the objects positioned therein, the person being interrogated sometimes finds it difficult to recreate that which he had seen but once; he might make some inaccuracies and even distortions of the topographical features, especially on those occasions when his perceptions were affected by the unpleasant nature of the situation. To a significant extent, the totality and precision of the features reconstructed under interrogation depend on the interrogated person's selectivity of perception, memory and presentations of distance. As a rule, country-folk land-surveyors, geologists and hunters have a higher degree of selectivity in recognising a landscape and they can easily recollect its particular features, and reconstruct them all in greater detail. A person's memory powers will be stronger if his original perception of the locality was acquired not just by contemplating it but by undertaking some other activities at the same time (for example, by organising an ambush, or in overcoming this or that obstacle). One must, of course, take into account the activity of various other factors which might distract his attention and weaken his steadfast concentration. The places which we recall best of all are those which have the most vivid, emotional and volitional values (the "strong points" of the memory).

The precision and totality of perception of topographical features depend on a series of subjective and objective conditions (defects of sight and hearing, state of health, strong emotional feelings, indifference to what is going on, the short duration of the observation, unpleasant weather conditions, the remoteness of the object under observation, and so on). The investigator must take all of this into account, both during the interrogation, and in the verification of evidence *in situ* and the evaluation of the results.

People develop different forms of topographical presentations. Some develop an elementary form of "route-map", for they can present and reconstruct in their mind the particularities of the locality only analytically, slowly, and in accordance with the particular route they have traversed; others make a more perfect presentation — a "survey-map" — and they can immediately recreate a complete map of the area in panoramic and stereoscopic form. Their presentation of the particular locality will naturally be more expressive, complete and detailed. Full and vivid memories facilitate a more certain depiction of the locality in the verification of evidence *in situ*.

A second, repeated perception or recognition strengthens the process of reactivating the interrogated person's original association of events formed during his first visit to this or that place, and thus they facilitate his memory's power of precision. It is therefore possible to say, in accordance with the laws of psychology, that the information given by the interrogated person in the verification of evidence *in situ* is, as a rule, more complete and precise than that given earlier during his interrogation in the investigator's office. At the same time such a correlation may result from the fact that the interrogated person (during the verification of his evidence *in situ*) indicating the route to follow and explaining the circumstances on the scene, reproduces the latter the way he observed them because he was not acquainted with these circumstances before. In these instances, the truth will be obtained only in the thorough analysis and comparison of the interrogated person's evidence and information given *in situ*, with the actual circumstances of the scene and the examination carried out earlier.

The revival of the memory of this or that part of the locality at the moment of pointing it out during the verification of evidence *in situ* takes place not only when the interrogated person has reached already this point of the locality and perceives it visually for the second time, but also when he is in a neighbouring part linked with the subsequent one by the same event. The psychological law forms one of the important tactical methods of conducting an investigation of evidence *in situ*, and the essence thereof is this: in approaching a given scene, as yet still not visible to the participants in the verification of evidence, the interrogated person describes it in detail and explains its links with the crime under investigation; only afterwards does he point it out and expound on the circumstances of the place while actually on site. Such a method facilitates a correct evaluation of the evidence. If his explanations given in anticipation (as a rule, they are more detailed than the information given in the interrogation) correspond to the actual circumstances on site, then does the trust in the verification of evidence increase.

A person's memory of the topography is activated by motoric memory. Therefore, in the verification of evidence *in situ*, it is expedient to suggest that the interrogated person should repeat those actions he had carried out earlier at this place. They should be performed in just that place where, in fact, they were performed at the time of the crime. It is also necessary for him to pin-point, firstly, the various objects linked with the event to be verified, and secondly, explain the circumstances and conditions from just that place where the interrogated person was situated and observed the items at the time the crime was committed. This facilitates the revival of previous associations of events and the more complete reconstruction of the circumstances of the crime in the interrogated person's memory.

His powers of recognition during the verification of evidence *in situ* to a large extent depend on objective factors, on the seasonal differences in rural setting, for example, on the weather and lighting conditions, all of which make it more difficult for the interrogated person to get his bearings. It is, for example, difficult to recognise a particular locality in a summer landscape if it was first observed in winter. That is why it is necessary to take these factors into account when choosing the time of the verification of evidence *in situ*. They should also be borne in mind when evaluating the results of this particular investigatory activity.

From the psychological point of view, the verification of a person's evidence *in situ* is characterised, not only by his passive reproduction of the events, but also by his mental activity, especially when for some reason or other, it is difficult for him to reconstruct the topographical image of the place. Therefore, it is necessary for the investigator to listen patiently to the explanations of the interrogated person without interrupting him with questions and personal observations. The recommended tactic of allowing him "to talk freely" is more acceptable; subsequently, it can be followed by questions to ascertain the more definite and exact details.

If the previous evidence of the interrogated person does not conform to the actual circumstances and/or his elucidations on site, the investigator should bring this to his attention and ask him to explain the reasons why they do not conform and, if possible, to indicate those objects and circumstances which he had described earlier. The investigator may, of course, make use of the plan or diagram drawn by the interrogated person at the time of his first interrogation and prior to the verification of evidence *in situ*. If the latter persists in his original story, the investigator must continue the verification of evidence. But in those instances when during the reconstruction of the circumstances on site, the interrogated person points out that his previous evidence was false and that he now revokes same, the verification of evidence should be concluded. The person should be interrogated anew with his explanations entered in the record. In such an instance, the record must note the fact that, in the verification of evidence *in situ*, the interrogated person could not indicate either the site or the circumstances of the crime being verified and that he revoked his earlier evidence.

If in the verification of evidence *in situ* the interrogated person points out some new strip of the locality or premises wherein some other material traces of the crime can be found (murder weapons, a corpse, stolen property, etc.), about which he had said nothing in the earlier interrogation, the verification of evidence should be curtailed and instead, with the same participants, an examination of the new site and all items found thereon should be conducted, the record of this examination should be taken down, and only then should the verification of evidence *in situ* be restarted and continued. To combine these two independent investigatory activities and to register them in one record would be unlawful.

4. The Recording of the Verification of Evidence *in Situ*

In recording the conduct and results of a verification of evidence *in situ*, the record, photographs, motion-pictures, tape and video recordings, and graphical facilities are all used to advantage. Facilities for the construction of duplicates, though widely used in the examination, are not employed at this stage, because the detection and removal of traces are not a part of a verification of evidence *in situ*.

The Record of a Verification of Evidence in Situ. Put in the introduction to the record is information about the site, the time and the participants of the particular investigatory activity; a list of specially invited witnesses and the rights and responsibilities explained to them; notes on the use of scientific and technical means, and lastly, the agreement of the interrogated person to participate in the verification of his evidence *in situ.*

In the descriptive part, the whole process and all the results of the verification of evidence are set forth in detail and in their correct sequence. Then comes a description first of the approach route of the participants, then of the surroundings, objects and other circumstances on the site of the verification; and lastly, the explanations of the interrogated person and the questions posed to him are all recorded. Such explanations should, where possible, be recorded word for word in the first person, but his activities should be written up in the third person. The record should also set forth in detail the interrogated person's remarks about any changes in the circumstances on the scene which might have taken place. This facilitates both a detailed comparison of this information with the original circumstances recorded in other materials of the criminal case, and a correct evaluation of the results of the verification of evidence *in situ.*

This section of the record also notes the use both of photographs, motion-pictures, and of tape- and video-recordings; then comes notification as to the particular objectives of such, the number of shots and their sequence, and finally there is a schedule of the times of starting and stopping all the various film and video sequences.

Basic information about the use of scientific and technical means for finalising and comparing plans and diagrams and other enclosures to the record (exposures of photographic film, film-reels and videotapes, etc.) are recorded in the final section. The record should not include any of the investigator's conclusions or judgements.

The record should be read and signed by all the participants in the investigatory activity.

The Use of Forensic Photography, Filming, Tape- and Video-Recordings. The enumerated technical means for recording the circumstances on the scene are widely employed in the verification of evidence, especially photography and tape recording. With the aid of orientation, survey, nodal, measuring, panoramic, and sometimes, detailed photography the route to the scene of the investigation of evidence against the background of more detailed reference points is recorded and pictures are made of the scene of the investigation and of those separate, important sections thereof which relate (insofar as criminalistics is concerned) to those separate parts of the scene pointed out by the interrogated person. And lastly, the objects and traces preserved on the site are photographed, as are the various actions of the person whose evidence is being verified. In taking photos, to explain the direction of travel and the disposition of the various objects and sections of the locality, the use of flags, patterns, landmarks and other indicators is recommended.

It is advisable to shoot photographs and motion-pictures from those points from which the photographs during the examination were taken (if this corresponds to the explanations of the person interrogated) and to do so with just the one type of lens and film, and under the same conditions and with the same magnification. This facilitates a comparison and strengthens the clarity in comparing the shots taken during the verification of evidence *in situ* with those taken earlier during the examination. The above recommendation should be complied with in those verifications of evidence which are carried out one after the other in just the one place, each with the participation of another interrogated person. In so doing, however, any artificial attempt to make the shots taken during the verification of evidence fit in with those taken during the examination is inadmissible. Each particular photograph must be supplied with its own sequence number and short explanatory notes. The film should also contain explanatory notes as to the criminal case concerned, the time and place of the verification of evidence, the names of the participants, the type of camera and the speed of shooting. The film should include one or two slides showing graphical presentations of the route to, and with maps and diagrams of, the scene of the verification of evidence. The film may also have a sound-track, prepared with the direct participation of the person interrogated.

In comparison with other technical methods of finalising the verification of evidence *in situ*, the video recording has a significant advantage in that it facilitates the synchronous recording of the circumstances of the scene, the actions and the explanations of the interrogated person; moreover, it enables the most complete filming of the whole process of the verification of evidence. The use of video-film in preliminary and court investigations demonstrates quite clearly that the video recorder has many advantages.

The graphical method of finalising evidence (preparation of plans and diagrams of the locality) is employed in every verification of evidence *in situ*, and facilitates a clear comparison of its results with those of the inspection carried out earlier. From the technical aspects, the preparation of plans and diagrams in the verification of evidence *in situ* differs little from the composing of analogous documents in the inspection of the scene of the crime. It is important that the approach route of the participants of the investigatory activity, the disposition of objects, the whereabouts of reference points and bearings, and other objects should all be clearly shown in the plans and diagrams drawn by the person whose evidence is being verified. Equally important as far as criminalistics is concerned is the clear presentation of those places indicated by the interrogated person (places in which were found weapons and traces of the crime, the corpse and hidden household things and places where the accomplices made their initial rendezvous). The plans and diagrams must be a graphical illustration of the scene registered in the record. The results of the employment of the above-mentioned forms of recording the verification of evidence *in situ* have a demonstrative and illustrative significance provided that they are used in their combination, while the photographs, film-reels, video tapes, plans, diagrams and records all have a definite idea linking them all.

CHAPTER XIX

TACTICS OF SEARCH AND SEIZURE

1. Getting Ready for a Search

Search is an action widely practised in investigation. If the investigator has enough grounds to believe that instruments of a crime, articles or valuables obtained in a criminal way and also other articles or documents which may be relevant to the case are in certain premises, or with a person, he makes a search to find and seize them.

A search may be made for locating wanted persons and also for finding dead bodies.

Depending on the specifics of the object to be searched, and the actions to be taken in the process, a search can be conducted in a dwelling or other premises, or in the open; there can be a repeated search, an "emergency" search not sanctioned by the procurator; a simultaneous, or "group" search, that is, a tactical operation consisting of several simultaneous searches according to a single plan in one criminal case; a search can be made on the premises occupied by diplomatic missions, and there may be a search of an individual.

The compulsory character of search actions involving inevitable interference in the sphere of the personal interests of the searched individuals, and sometimes of other persons, makes search different from other investigatory activities, as, for instance, from inspection of the scene of a crime. During an inspection of the scene of a crime, for instance, in a forest, one may conduct a search for a buried dead body, instruments of crime and other real evidence. But in that case the search does not affect the citizens' interests. Whenever such actions involve a limitation of the individual rights of a person (for instance, during a search for traces of a crime in the dwelling of the family of a missing person), they exceed the limits of an investigatory inspection and so must be regulated by the law.

The law of criminal procedure contains provisions ensuring the legality of a search. Under the law, there must be grounds for making a search.

The law does not elaborate on the concept of "sufficient grounds" for conducting a search. Such grounds may be any facts related by witnesses, victims, suspects or defendants, or obtained from other sources of evidence indicating that articles or documents relevant to the case are in some place or in the possession of some person. Materials obtained during crime detection operations can also be a source of such facts.

The investigator issues a document, known as a warrant to conduct a search, which provides legal grounds for this action.

The warrant names the person subject to a search, sets the limits for search actions (a dwelling, a house and garden plot, a workplace, a hotel room, etc.); if possible, it lists the articles and documents to be found and seized; and it points out, in general terms, the facts that provided grounds for the search.

A search must be sanctioned by a procurator. Only in exceptional cases, e. g., when a delay of a search may result in concealment or destruction of evidence or seriously obstruct investigation, the legislator may allow a search without the procurator's sanction, though the procurator should be notified in writing about the search within twenty-four hours.

On these grounds a search may be conducted also in night hours.

As the investigator has recognised the necessity of a search related to a criminal case and has issued a relevant warrant he draws up a plan of the search.

Each search is individual in tactical terms. The preparations for a search and the search itself are influenced by the peculiarities of a criminal case, the type of the articles being sought, the personality of the individual to be searched, the specifics of the object of search, and other circumstances. We can mention a few recommendations helping the investigator to achieve the best possible results during a search.

Before arriving at the place of a search the investigator should have a clear idea about that place. The information about it will help him to determine the scope of search actions and enable him to plan the succession of actions at the place of the search, and to prepare the necessary technical means in advance.

To obtain information about the place, the investigator may request the layout of a building and inspect the place of a future search or the locality where search actions are to be conducted.

On the basis of the materials of a criminal case and the data obtained during the operative-search activities, the investigator should form the idea of the personality of the individual to be searched and the members of his family and their way of life, and their daily routine. This will enable him to determine a correct line of conduct at the site of a search and the tactics of search actions.

The main tactical rule of a search is the surprise effect giving the criminal no chance to escape and ruling out a possibility that the persons involved would hide or destroy real evidence. Therefore during the preparations for a search the investigator should, using the information available, think over the ways of surreptitiously reaching the place of a search and entering it rapidly and without hindrance. If there is a reason to believe that the person to be searched would counteract or put up armed resistance, the investigator should foresee appropriate measures to curb such actions.

When collecting information about the site of a future search and about the personality of the individual to be searched, and also when conducting other preparatory measures, the investigator should be careful to rule out a leak of the plans to make a search.

To ensure an effective search, it is important that the investigator should determine the size and composition of the investigatory team. If a search is to be made in a number of premises or on large areas, or if a big amount of work is to be done during a search, the investigatory team should include, apart from the investigator himself, other operatives who would be assigned to specific areas to be searched. Since it is possible that the persons being searched would try to get rid of incriminating evidence (e. g., that they would attempt to throw out of the window the articles that might compromise them) or to signal to accomplices that a search is taking place, the team should include people watching the premises and guarding the locality around it.

Depending on the character of the articles to be seized, the group may include experts. Thus, a bookkeeping expert will help the investigator to pick out of a multitude of papers those which are needed for investigation, and an art expert will help to find and remove stolen works of art.

If a great amount of technical work is to be done at the site of a search (e. g., if excavations are to be performed), then appropriate specialists and workers are invited.

During the preparations the investigator sees to it that specially invited witnesses to a search would be present. It is advisable that they be included in the investigatory team before it sets off to reach the place of a search. It is important that this be done in cases where it is anticipated that the suspect and other persons concerned about the outcome of the case would offer resistance.

If a search of the suspect and other persons present on the site is planned, the investigatory group should include operatives and witnesses of both sexes.

The investigator should check in due time that the necessary technical equipment is in good order.

Considering the specifics of the site of a search and the character of the sought articles, the investigator should have, apart from the usual criminalistic kit, instruments and devices that may come handy during the search. Thus, if a dead body is to be found, the investigator should take along probes, sweeps, instruments locating traces of biological disintegration (corpse finders), and chemicals to find blood traces. If metallic instruments of a crime are sought for, a metal detector should be available.

If it is necessary to perform several searches simultaneously after a single plan (for instance, of several accomplices in a theft), the investigator should plan simultaneous searches in several places to prevent the accomplices from informing one another about a search. He should also work out adequate communication procedures and obtain the necessary means of communication to ensure a rapid exchange of information among the investigatory teams; finally, he should brief the team members.

2. Tactics of a Search

The arrival at the site of a search should be planned so that the person to be searched or an adult member of his family would be found at home. It cannot be ruled out, however, that for tactical reasons the person to be searched would be brought to the site by the time the search begins. A search may be made in the absence of the person to be searched and of the adult members of his family only in exceptional cases, when they cannot be present for sound reasons.

As he arrives at the site of a search, the investigator announces to the person to be searched the purpose of the arrival and shows him the search warrant.

The person to be searched is notified about his rights and duties, and the act of notification should be registered in the record of the search. Besides, the searched person is asked to voluntarily hand over articles and documents relevant to the case to the investigatory team. If they are given voluntarily, a search may be made only if the investigator has grounds to believe that not all the required articles have been handed over.

Before starting a search the investigator should examine the site, specify the amount of the search work to be done, determine the problems requiring special attention, and distribute the duties among the team members.

To ensure normal conditions for a search and preclude possibilities for a destruction of available evidence, the searched person and other people with him can be brought together in one room, they may be asked not to talk with one another, not to make telephone calls, and not to leave the premises until the search is over.

Children must be taken away from the premises to be searched.

When the investigator has grounds to assume that some or other person present in the searched place is hiding on his body articles or documents relevant to the case, that person may be subjected to a body search.

If strangers appear at the place of a search, they may be temporarily detained by the investigator until the end of the search. If these persons have come to perform their work (a doctor, a postman, etc.), they must be identified, the reasons of their coming ascertained, and if their arrival has nothing to do with the criminal activities of the searched person, the investigator lets them go. When necessary, they are told to keep the fact of the search secret.

During a search the actions of the team should be performed systematically and thoroughly. It is inadmissible that the investigator or other team members make a cursory examination of an article and then go over to another object that attracts their attention. Naturally, there is no need to thoroughly examine the articles which, due to their physical or other properties, cannot contain the sought-for items. All the other articles at the site of the search should be thoroughly examined.

It should be borne in mind that, apart from concealing articles and documents in thoroughly camouflaged hiding places, some criminals, expecting the investigator to make a search precisely in such places, put the sought articles where they can be easily seen, hoping that the investigator would not pay due attention to them (for instance, they may leave documents that may serve as evidence of a crime among other papers on a desk). Criminals can sometimes use as hiding places articles that at first sight seem to be no good for that purpose (hiding gold or other valuable items in a jam pot, weapons and ammunition in books, etc). Therefore the investigator should carefully examine the furniture, clothes, footwear, household appliances, books, children's toys, tableware, kitchen utensils, food, and so on.

When searching rooms, outhouses and other premises, the investigator should progress in one and the same direction, as, for instance, along a spiral or clockwise, examining one article after another, then go over to the centre of a room, the walls and the floor, after which he should move on to the next room.

When a search is made in the open, the area should be divided into sectors or squares, and individual team members should be assigned a part of the territory. Each section is examined in a definite order, and technical equipment is used when necessary.

During a search the investigator should not lose sight of various negative circumstances, i. e., signs indicating where a hiding place is located. Thus, a small patch of land overgrown with faded yellow grass against a fresh green background, freshly dug earth in an orchard, a part of a wall with fresh wallpaper, glistening heads of new nails in a floor plank, and so on, should alert the investigator and become an object of thorough examination. Sometimes the behaviour of domestic animals or birds can indicate a hiding place or a place where a dead body is buried.

To verify his suppositions, the investigator can probe upholstered furniture, bedding, pieces of land, etc., with a sharp thin rod. When this is not enough, more sophisticated devices are used, such as metal detectors, corpse finders, portable X-ray machines, or other equipment. If necessary, a part of an obstacle to a hiding place may be destroyed and household appliances and devices may be dismantled.

If during a search the owner refuses for some reason to open a locked hiding place, the investigator has a right by law to open it himself, avoiding, however, unnecessary damage to locks, doors and other objects. The methods he chooses for opening a locked hiding place should be registered in the record of the search.

To discover among a multitude of similar articles those which may be relevant to the case, the investigator can take samples for making a simple analysis. Thus, to find narcotics among other medicinal drugs, or to identify blood stains and other substances of biological origin, an expert can use proximate analysis methods on the spot.

During a search the investigator must take into account all available information about the person being searched, since this would help choose correct and effective tactics of the search.

Investigatory practice has shown that there is a certain connection between the way sought articles and documents are hidden and the hiding place, on the one hand, and the occupation of the person being searched, his inclinations and hobbies, on the other. More often than not, a person draws back on his professional experience and is influenced by his inclinations in choosing a hiding place. Therefore the investigator should pay special attention to inspecting such places.

In some cases the behaviour of the person being searched or the behaviour of members of his family can give a clue to the way a search is to be made. For instance, the person being searched may grow too nervous as the investigator approaches a definite object, or show sign of relief when he moves away from that object. If the person being searched insists that a place cannot be used for hiding definite articles, this should alert the investigator. For example, during a search the wife of the person accused of stealing money feigned hysteria and began throwing jam pots into a corner of the kitchen. That made the investigator suspicious. The floor in the corner was lifted, and the hidden money was found.

It is advisable to instruct a team member to watch the behaviour of the persons present during the search.

Often people being searched hide real evidence in dirty linen, in children's clothes and toys, etc. Sometimes they place documents that may compromise them in the books of a home library, hoping that the investigator would get bored by monotonous work and his attention would be dulled. In cases like these, determination and persistence of the investigator are of great value. During a search the investigator should be tactful.

When a search lasts too long, it is recommended to make short breaks for a rest.

During a search the investigator often comes across facts related to the personal and intimate life of the person being searched. For instance, he may hit upon the private correspondence of the person being searched, and also documents or articles related to the intimate life of individuals who have nothing to do with the case being investigated. The law, protecting the interests of citizens, makes it incumbent on the investigator to take measures so that this information would not be made public. So, during a search the investigator should not draw the attention of the invited witnesses and other persons taking part in the search to such facts unless they have a bearing on the case. But if they have and the invited witnesses and those present should inevitably be informed about them, the investigator has the right to warn that the information must not be divulged.

Apart from the articles and documents relevant to the case, other articles indicating that the person being searched has committed another crime, and also unlicensed firearms and other items that are normally not allowed to be used by citizens, are taken away from him.

In some cases a second search may be made. That is done, as a rule, when the first search has for some reason been superfluous, or when new information has been obtained during further investigation, indicating that articles and documents related to the newly discovered episodes of criminal activity are hidden by the person once searched. Besides, a second search may be necessary when a person once searched, believing that his dwelling would no longer interest the investigator, brings the articles looked for during the first search back there.

When a search is made at a working place or in a hotel, the investigator should examine the articles which are used by the person being searched, or are his property. The articles to be inspected may be the desk of a person being searched, the tools and instruments he uses, the wardrobe where he keeps his working clothes; a bed in a hotel, and his personal belongings. The investigator has no right to inspect the property of the other persons working or lodging together with the suspect. He may, however, ask these persons to examine their belongings and tell him if there are articles that are not theirs.

A personal search, like all other kinds of search, may be made only if there is a motivated warrant of the investigator and if it is sanctioned by the procurator.

A personal search may be conducted only by an individual of the same sex with the person being searched, and in the presence of invited witnesses of that sex. A special room is assigned for the purpose, and all irrelevant persons are asked to leave it. It is preferable that in case the searched person would offer resistance, a personal search be conducted by two investigating officers or operatives. In the first place, the pockets are examined, and weapons and all other articles that can be used in resistance (tobacco, etc.) are removed. The pockets, bags, and other articles that the searched person has on him are thoroughly inspected. If the body of the searched person is to be examined, it is advisable to invite a doctor.

3. Recording the Results of a Search

All the articles and documents found during a search are shown to the invited witnesses and described in detail in the record, mentioning the number of items, their distinctive qualities and the places where they were found. When describing the instruments of a crime, stolen property and other real evidence, it is necessary to mention their size, material, weight, colour, registration numbers, defects and other distinctions, and traces of blood, sperm, earth, etc., on them. As for documents, their material, requisites, the mode of execution, dye-stuff, and the opening and concluding phrases are recorded.

If the listed objects are packed, the type of the packing material and its specifics are mentioned. When a hiding place is discovered, its location, arrangement, size and the articles it contains are all recorded. The hiding place and its contents are photographed. Then close-up photographs of the items found in the hiding place are made. The location of the hiding place and other places where the sought-for articles or documents have been found are marked on the diagrams and charts of the place of the search, and attached to the record.

If the articles or documents removed from the place of search are numerous and it would take a long time to inspect them on the spot, they may be properly packed and sealed and listed in detail in the record for later inspection. In this case the inspection is done in the investigator's office. At this stage, it is advisable to invite the same witnesses who had been present during the search.

4. Tactics of Seizure

Seizure resembles a search in many ways. Like a search, the purpose of this investigative activity is to take away articles and documents relevant to a criminal case from a citizen or from various enterprises, institutions and organisations. The requirements registered in the Criminal Procedure Code fully apply to the act of seizure. However, as distinct from a search, seizure always concerns definite articles and documents and is performed when it is known precisely who has them and where.

In case of seizure there is no need to make a search and therefore the interests of citizens are less affected. For this reason seizure has to be sanctioned by the procurator only when it concerns mail, including telegrams, and articles and documents which may be a source of information that is a state secret.

During the collection of mail only postal workers may be invited as witnesses. This requirement considerably limits the possibility that the information contained in the mail may be made public.

During the removal of articles or documents related to the intimate life of a person, the invited witnesses should be warned that the facts they would learn must not be made public.

In cases when seizure calls for the picking out of articles or documents from a mass of similar objects that are relevant to the case, it is advisable to invite a corresponding specialist (for instance, a bookkeeper when papers related to a case of embezzlement are to be removed from the accounts department of a factory).

If the articles or documents subject to seizure are not given to the investigator under some pretext, he has the right to seize them by force. In cases they are hidden by the persons concerned, a search is to be made instead of seizure.

Similar methods are used for recording the results of a seizure and a search.

CHAPTER XX

TACTICS OF INTERROGATION

1. Psychological Principles of Interrogation Tactics

Interrogation is an act of the legal procedure performed with the purpose of eliciting evidence from the interrogated person concerning the circumstances in which a crime was committed and the identity of the accused. Interrogation is a most widely used and complex investigative technique.

The purpose of an interrogation may be to elucidate the circumstances that constitute the object of proof, as well as other circumstances relevant to establishing the truth in a criminal case.

Interrogations may be classed as follows:

— according to the position of the interrogated person in the legal procedure: interrogation of a witness, a victim, a suspect, an accused (defendant), or an expert;

— according to the age of the interrogated: interrogation of adults or minors;

— according to the participants in an interrogation: an interrogation is conducted, as a rule, by the investigator alone, but in some cases a procurator, an investigation department chief, an advocate, a teacher, the parents (or legal representatives) of a minor, and an interpreter may also take part. Interrogation during confrontation and in court has its own specifics.

There are primary and repeated interrogations.

To receive full and truthful testimony, it is necessary strictly to keep to the standards of criminal procedure applicable to any interrogation and those typical of its specific kinds, and to employ effective tactical methods, depending on the situation obtaining during investigation.

The testimony given by the interrogated is not always truthful. In some cases, the interrogated may deliberately wish to mislead the investigator. In others, a person wishing to cooperate in establishing the truth cannot recall some circumstances for objective and subjective reasons, or, while genuinely trying to give accurate testimony, wrongly describes the events. Therefore, to employ correct investigation tactics and properly assess the testimony, one should know the factors on which the truthfulness of testimony depends.

The forming of testimony is a complex psychological process influenced by external circumstances and the individual qualities of the interrogated. The objective and subjective factors determine the true and complete nature of testimony. Therefore, in order to correctly devise the tactics of interrogation and to verify and assess testimony, one should trace the passage of information beginning with the source from which it became known to the interrogated, to its being recorded in the papers of the case. This route may be subdivided into four stages: (1) perception of information; (2) the act of remembering; (3) its reproduction for the investigator; (4) reception of information by the investigator and its recording in accordance with the established procedure.

Man's cognition of the material world begins with sensation. Sensation is the primary process of receiving information about the individual qualities of things and phenomena. In itself, it does not give a complete idea of things, but only provides data enabling a person to judge about them. The sense organs react to the signals coming from the outside world within the limits of sensation. These limits may vary with the changes in the outside conditions, the state of a person's body, or as a result of one's mental and physical shortcomings. Therefore, in assessing testimony one must take into account (and verify) the external conditions and state of a man's sense organs at the moment of perceiving information.

Sensations make up the basis of a more complex cognitive mechanism of perception. This is an active process in which the human mind penetrates into the essence of things, relying on thinking operations and logical methods. During perception the incoming information is added to the previously accumulated knowledge. It is comprehended and interpreted by taking into account all the preceding experience of a given person. Therefore one and the same object perceived by different people may cause different impressions in them.

Perception is specific in that it produces an integral image of an object, and it is only during further observation that individual details are revealed. Having acquired a general idea of an object, a person can immediately react to it. But this quality can be a source of mistakes in testimony. Such mistakes can occur when a witness extrapolates his general assessment of an integral object to its details, or when gaps in perception are filled uncritically with elements obtained from the past experience. A critical assessment of a perceived object may be weakened when a man is in danger. In such a situation most people tend to exaggerate the danger, and harmless gestures and objects may seem to be associated with an attack. Therefore during an interrogation, especially of victims, it should be remembered that they may tend to exaggerate actions which they regarded as threatening.

A vast flow of information has an effect on the sense organs, but far from everything is reflected in man's mind. So that more of the information would be reflected, a man has to concentrate on a definite object or action.

Attention may be unwitting and deliberate. The former is caused by the peculiarities of the objects of attention, and the latter is formed and maintained as a result of consciously set goals. Deliberate attention ensures more productive perception, and in this case the interrogated can give most complete testimony. But such detailed testimony must be verified, and the investigator should learn the motives of deliberate attention and find out if this is natural for a given person in a given situation.

Most inaccuracies in testimony concern time, space and speed, i. e., whenever a witness makes an evaluation. The accuracy of such evaluations depends on the conditions of perception, the criteria of evaluation, and the personal qualities of the interrogated (age, occupation, etc.). The sense of space, time and movement forms with practice. So one should be most careful when dealing with such testimony given by persons lacking experience (for instance, children).

The mental processes of sensation and perception are an indispensable and necessary condition at the first stage of forming testimony and largely determine its content and truthfulness. If actually existing objects and phenomena have been wrongly perceived, testimony related to them would be wrong, too. Conversely, correct perception would produce correct evidence during an interrogation.

The second stage of forming testimony is the memorisation of information. The main thing here is a human memory's ability to record information and retain it without distorting its volume and content. The tenacity of memory depends, above all, on perception. What is perceived clearly and precisely is better memorised. So, everything that determines the quality of perception determines the quality of remembering.

Remembering can be unwitting and deliberate. The latter is more effective because a person makes a conscious effort to keep in memory what he has perceived, and uses various methods to do that. As regards criminal procedure, this kind of memorisation takes place when a person witnessing an event in anticipation of a possible interrogation, analyses it, concentrating on the details, reviewing them in his mind, trying to memorise them. In this instance, as in the case of deliberate perception, the investigator should find out the motives of such behaviour. Deliberate remembering has its negative aspect: a person trying to keep in memory the information which he believes to be important may sometimes not take in what he thinks are minor details, though precisely they may be most important in investigating a crime.

Forgetting, which is yet another quality of memory, increases with the passage of time. The time during which information is forgotten depends on various factors. Information perceived mechanically is forgotten faster than when it is perceived sensibly. A man's stable interest in the received information, which he reviews and uses in practice, keeps it long in his memory.

Forgetting is not absolute. Experiments have shown that the potentialities of human memory are enormous. By using definite tactics it is possible to activate the thinking effort and will-power of the interrogated, so helping him recall what he seemed to have forgotten for good.

As time goes by the received information is partially obliterated, to be replaced by other bits of information from the previous or subsequent experience. In the same way, gaps in the received information may be filled. Moreover, with the passage of time some images in the mind are created by imagination; and information received from other persons may be considered to be the product of one's own observations.

To separate such "stray" information from genuinely perceived information, an interrogation should be made more detailed, and the interrogator should find out exactly under what conditions the interrogated had received the information he gives out as testimony.

The information perceived and retained by memory which is needed for the proper handling of a case should be reproduced during an interrogation. To give testimony the interrogated should recall the circumstances relevant to the case. If the interrogator's questions are properly formulated, the images of the objects and phenomena, which had once been well remembered, reappear in the witness's memory without difficulty, while to recollect other objects the interrogated should mobilise his thinking effort.

Recollection of images is facilitated by associations, when notions that have appeared in memory revive others associated with them. There are associations in time (when the interrogator asks about facts learnt by the witness simultaneously with other facts relevant to the case), in space (when the interrogated is reminded of the objects which were in the same place at the moment of perception), in similarity, etc.

Another effective method of reviving images in memory is recognition (identification of objects perceived during the interrogation with those perceived earlier). By showing to the interrogated real evidence, photographs, and reminding him of the way things were arranged at the place of an incident, the investigator stimulates his memory, helping him to recall the circumstances associated with a given event. This method enables the interrogated not only to recognise an object shown to him, but also to recall the circumstances under which he saw it.

To recall the events and facts relevant for the investigator is not enough — the interrogated is to give testimony on them. Getting ready for an answer to a question, he selects the information to be given to the investigator and expresses it in words. At this stage the accuracy of the transmission of information depends on the capability of the interrogated for correctly expressing his thoughts. As is known, one and the same word may have different meanings, and the meaning of a phrase may depend on the word order and the way a sentence is composed; speech can be accompanied by interjections and other communication aids such as intonation, gestures, emphasis, facial expression, etc. Due to all this, the meaning of what has been said is quite often misunderstood. Witnesses, defendants and other persons participating in a court interrogation often say they misunderstood the investigator or that the investigator misunderstood them during an interrogation (obviously, sometimes such statements are deliberately false). Therefore the investigator should seek to achieve full mutual understanding with the interrogated, and precision and clarity of the questions asked and the answers to them. He should use words which are well understood by the interrogated and cannot be misinterpreted. An interrogation can be considered exhaustive when the testimony contains no reservations and ambiguities and when the circumstances relevant to the interrogation are described (not just named or mentioned) by the interrogated accurately, unambiguously and in detail.

At the concluding stage of forming testimony the investigator receives information and records it in the documents of the case in keeping with the established legal procedure. Listening to the narration of the interrogated and watching his behaviour, the investigator receives diverse information from which he should single out all that is essential for solving the problems posed in a case. This is achieved through concentration. Whenever the interrogator relaxes, this is bound to lead to mistakes, for he can miss discrepancies in the answers of the interrogated, a lie or incomplete testimony, or misunderstand his answers.

Considering the influence of all these factors on the formation of testimony, the investigator should be most attentive when recording testimony. He should make sure the interrogated has read attentively the record. It often happens that the interrogated, being inattentive, trusting the investigator too much, or being shy, may disregard discrepancies between his testimony and the record.

2. Preparations for Interrogation and Tactical Methods

Thorough preparations for an interrogation largely ensure its ultimate success. The method of preparations depends on the part played by the interrogated person in the legal procedure and the object of the planned interrogation. In different criminal cases the aim of the tactical methods used in preparing for an interrogation may be as follows: to find out who may know the circumstances relevant to the case; study the personality of the interrogated; determine the subject of the future interrogation; fix the time, place and sequence of interrogating several persons, and the method of summoning them for the interrogation; select and prepare real evidence and other material to be used during the interrogation; and clarify matters requiring special knowledge or a study of specialist literature and terminology.

It is essential to devise a plan of the interrogation. This should specify the circumstances to be ascertained and the tactical methods to be employed to obtain truthful testimony. Unless clear goals are set and ways of achieving them are determined, the interrogation would be ineffective and inevitably lead to a second interrogation, which may complicate and delay investigation and create additional and unjustified difficulties for those summoned.

The witnesses and victims having valuable information are to be identified during the study of the materials of the case. In addition, persons who may possess the required information can be indentified through appropriate crime detection measures. As the investigator looks for the persons who can give testimony, he simultaneously learns whatever they might know about the circumstances to be ascertained.

During preparations for an interrogation the investigator should form an opinion about the personality of the interrogated and know in what way he is related to the investigated event and to the persons involved in it. To form an objective opinion, the investigator uses independent, unconnected sources.

After the investigator obtains the necessary data on the persons to be interrogated, he uses the data, already at the preparatory stage, for tactical purposes, in particular, for determining the sequence, time and place of interrogation, and selecting an appropriate method of summoning the suspects and witnesses. If there are several accused persons (or suspects), witnesses, or victims the order in which they are to be interrogated is determined in accordance with a number of factors, primarily depending on the amount of information they can give. It is advisable that the persons who are likely to give more information would be the first to be interrogated. These persons will be expected to give full and truthful testimony at the interrogation. In turn, the accuracy of their testimony will depend on their personal characteristics, their status under the legal procedure, and their relationship with the other people involved in the case.

As regards the time of interrogation, the law of criminal procedure mentions only the time of the first interrogation of the suspect and the accused. Depending on the situation, the investigator himself should decide whom he will interrogate and when. Persons who can provide information required for preventing a crime should be summoned for interrogation urgently. An interrogation must not be delayed when there is reason to expect a contact between those interrogated or an influence exerted on them by other interested persons. Urgency of an interrogation may be required for other tactical considerations, for instance, when it is necessary to obtain testimony on the circumstances found out when the place of a crime was inspected or during a search. On the other hand, it is sometimes necessary to postpone an interrogation to collect evidence required for it, to prevent the person summoned for interrogation from being influenced by interested persons, and for other reasons. When fixing the time of an interrogation it is necessary to take into consideration the emotional state of the person to be interrogated. If he is in a state of great agitation or confusion under the impact of an incident, then it is sometimes advisable to postpone the interrogation until he calms down.

The investigator conducts an interrogation at his office or, if the accused is under arrest, in a detention ward. An interrogation may also be conducted at a place where the person to be interrogated can be found, if such a person is unable to respond to the summons (for instance, because of an illness). Persons under medical treatment can be interrogated if this is urgently required for investigation. In this case the investigator should make sure that no harm be caused to the diseased. When the health of the person to be interrogated is in a grave condition, a physician's permission is required. A physician must be present during such an interrogation.

The investigator may summon suspects or witnesses for interrogation by issuing a summons, sending a telegram or making a telephone call. The method chosen by the investigator should ensure the timely arrival of the person to be interrogated. If the summoning for interrogation should for some tactical reason be kept secret, the investigator may send a messenger or personally invite the person he intends to interrogate.

During an interrogation the investigator may discover that a suspect or witness has forgotten some details or is trying to mislead him. To prevent that, he should prepare in advance real and other evidence which may be useful in helping the interrogated to recall some or other circumstances or exposing his intention to evade giving testimony or to give deliberately false testimony.

In some cases the investigator may be faced with industrial, technical or other specific problems. This may require the knowledge of facts related to an industry or to some other sphere of the economy, and the understanding of special terminology or concepts. Unless he studies the process that is going to be the subject of testimony and learns relevant terms, the investigator will face the risk of not being able to speak a "common language" with the interrogated and may misunderstand or even distort the meaning of the testimony. In such cases it is advisable to study the required normative material and special literature, or to consult an expert. It may also be useful to pay a visit to a corresponding enterprise and study the production process.

It is essential that a plan of an interrogation be ready in time. The plan should provide for the largest possible number of versions, and it should be flexible enough to be corrected during the interrogation.

Testimony is more complete, if the questions asked during an interrogation are clear and precise. This pertains especially to formulating questions that prompt the subject of a freely told story. Openings like "Tell me all you know about it", are too general and do not suggest a subject, leaving it to the interrogated to decide which facts are to be mentioned. Even a person wishing to give exhaustive testimony may be misled by an improperly put question and omit important facts, considering them insignificant. Therefore questions must be formulated clearly and in an easily understandable form.

The form of a plan largely depends on the experience of the investigator and the complexity of the interrogation. It may not be necessary to write a plan when a specific matter is to be cleared up. But when an interrogation is going to be complex, it may be necessary not only to write a detailed plan, but also to draw a chart and clearly formulate the main questions. The interrogation plan is often made in the form of a table, in which similar elements are grouped together. The headings may include, apart from the time and place of an interrogation, the following: (1) the circumstances under which information is expected to be received, and the sequence of finding out the facts; (2) reference to the material available on each of the circumstances; (3) the questions intended to clear up each of the circumstances; (4) real evidence, photographs, documents and other things to be used or shown to the interrogated if necessary; (5) other tactical methods which the investigator is going to use. This list gives an idea of not only the content of a forthcoming interrogation, but also of the amount of preparations to be done.

Tactical Methods of Interrogation. Tactical methods are employed to ensure an all-round and objective examination of the circumstances of a case. They should necessarily be in keeping with the law. Neither threats, nor violence, nor blackmail, nor methods infringing on the rights and legitimate interests of the interrogated or degrading his honour and dignity, and which can lead to a provocation, deception, or to playing on the vile sentiments or ignorance of the interrogated, are inadmissible.

The chief part played by the investigator during the interrogation obliges him to be objective, principled, attentive and tactful with the interrogated. Bias or suspicion are inadmissible.

An interrogation on the substance of the case is preceded by a definite procedure. The investigator ascertains the identity of the interrogated and, considering his personality traits, chooses a way of explaining to him his legal status, rights and duties.

Testifying begins with a free narration by the interrogated. It is sometimes useful to prompt him the way of telling his story: to begin with a definite moment and then make references to the sources of his knowledge (he saw it himself or somebody had told him) chronologically, proceeding from the cause to the effect, mentioning as many details as possible; to mention additional sources of evidence (naming persons who can confirm it or suggesting a way of checking up the facts), and so on.

A freely told story is an organic part of the interrogation and therefore should never be ignored, however brief or long it may be. Even when the interrogated himself wishes to start answering questions outright, the investigator should try and get free narration out of him.

The investigator should be able to listen to the interrogated attentively. As is known, an interested listener stimulates the teller to say more. But if the investigator is inattentive, the interrogated usually shortens his story. The investigator should at any moment show his attention. In some cases encouraging remarks may be quite helpful. But such interference in a narration should be made with tact, with no pressure exerted on the interrogated to obtain desired information.

As a free story is told, the investigator analyses the testimony, getting the idea of how much the interrogated knows and of his relation to the events and the persons involved, registers omissions, inaccuracies, and discrepancies in the testimony, comparing it with other information available in this case. As he listens, the investigator makes corrections in the plan, noting what questions the interrogated left unanswered, changing the questions he was going to ask, formulating new questions, and so on.

When a free story has been told, the investigator may ask questions to obtain testimony about the events the interrogated knows about, those which he failed to describe, or about which his story was incomplete or incorrect. Testimony may be incomplete or incorrect for various reasons. A story may be inaccurate because the information was perceived under unfavourable circumstances, or due to other factors that influenced the formation of testimony. It may also happen that the interrogated remembers some circumstances well, but does not pay attention to them, seeing no connection between them and the investigated crime and so makes no mention of them. And, last but not least, he may deliberately omit definite facts, or change them, to mislead the investigator.

The questions addressed to the interrogated may be additional (asked to obtain new information); specifying; reminding (asked to help the interrogated to recall what he has forgotten); and they may be control questions (asked to check up the testimony). Leading questions that would prompt the interrogated to give desired answers are inadmissible. The value of evidence contained in an answer to a leading question is questionable, since it is not known whether the interrogated has said what he knows or what the interrogator wanted to hear. Leading questions are especially dangerous when the interrogated is not sure about the events he is asked to describe. A negative influence can be exerted on the interrogated not only by the question itself, but also by the way it is asked, its tone, its being connected with the earlier testimony, its place among other questions, and by the investigator's excessive insistence on clearing up some or other point. All this may lead to inaccurate answers.

Therefore the questions should be to the point, asked in a form corresponding to the intellectual level of the interrogated. They should never be intended for leading him to a definite answer.

The tactical methods used when the interrogated is willing to give truthful and exhaustive testimony are designed to help him recall all the relevant facts and ensure that they are duly reflected in the record.

When the interrogated is trying to evade giving testimony or gives untruthful evidence, the investigator resorts to tactical methods making the interrogated change his negative attitude and give sincere testimony.

Persuasion is the main way of exerting psychological influence on the interrogated to convince him that it is hopeless to conceal the truth. The investigator is justified in appealing to the positive personality traits of the person being interrogated, pointing out discrepancies or inaccuracies in his testimony, and in producing real evidence. One should not rely on a single set of tactical methods or believe that they would automatically produce an open-hearted confession and truthful testimony. Tactical methods should be used in a combination. During an interrogation the investigator should be active in using them, persistent, tactful and patient, and he should conduct an interrogation with good skill and knowledge.

3. Tactics of Different Kinds of Interrogation

The Tactics of Interrogating the Accused and the Suspect. The first *interrogation of the accused* takes place after the latter has been familiarised with the charges brought against him. It is the right of the accused to give testimony, and he should be offered a possibility to give full testimony on the merits of the charges. He is not punishable by criminal law for refusing to give testimony or for giving deliberately false evidence. At the beginning of the interrogation the investigator asks the accused whether he would plead guilty. But his avowal of guilt may be placed at the basis of accusation only if this is confirmed by the available evidence. The chief purpose of interrogation is to obtain testimony on each point of the charges. The accused should be asked in what way his testimony can be confirmed and verified.

The accused often tends to conceal the truth and confuse investigation. But it cannot be ruled out that he may repent of his wrong doing and tell the truth about it. In this case tactical methods are aimed at getting an exhaustive, truthful testimony from the accused.

If the accused does not wish to give sincere testimony, the investigator should seek ways of changing his negative attitude. The first thing he should do is to appeal to whatever is positive in the personality of the accused and so to induce him to see in a critical way what he has done, realise his guilt and the inevitability of a fair punishment, if the accused is really guilty. The significance of frank repentance should be explained to the accused.

The material to be used for designing tactical methods of interrogation can be derived directly from the testimony given by the accused. While listening to and analysing testimony, the investigator notes where it differs from other relevant evidence. When giving testimony, the accused may disclose some facts exposing him, facts he had not paid attention to, or which he just blurted out. If necessary, all these facts should be checked and used during the interrogation.

Discrepancies in testimony can be found by putting specifying or control questions concerning individual objects or details of an event. The accused cannot foresee all the circumstances that will be discussed during an interrogation, no matter how thoroughly he has prepared himself for that, especially when the interrogated refers to an alibi or when several defendants give deliberately false testimony on which they had agreed among themselves.

Discrepancies in testimony given by several accomplices can be used as a clue by the investigator who wishes to obtain truthful testimony. In most cases the behaviour pattern of accomplices in a crime is such that each of them fears to be the first to give testimony, on the one hand, and, on the other, fears to be forestalled by the other accomplices. Using appropriate tactics, the investigator should overcome the unwillingness of the interrogated to be the first to give truthful testimony and at the same time to increase his apprehensions about being "too late" with repentance. When using such a tactical method, one should take into account the personal qualities and role of each accomplice in various episodes of a crime.

More often than not, an accused expects to avoid punishment, hoping that the investigator is inadequately informed and does not know the facts that can disprove or discredit his testimony, or expose his lies. Such an attitude can be changed by producing undeniable evidence. The evidence may include proofs that are known or not known to the accused, and which are arranged in a way which shows that the attitude adopted by the accused is hopeless. Evidence should be selected with due account of the character of the interrogated, since its effect on different people may vary: what seems very convincing to the investigator may leave the accused unimpressed. When preparing evidence to be produced before the accused, his attempts to discredit it should be precluded. So, before the evidence is presented, the investigator should question the accused about the circumstances associated with the evidence.

If the investigator has a combination of proofs exposing the accused, then it becomes easier to get truthful testimony from him. But there are times when the investigator has only circumstantial evidence, especially at the initial stage of an investigation. In this case, too, one can expect to achieve positive results. An unexpected question or evidence can destroy the position of an accused which seemed to him indestructible. Unprepared for a new situation, the interrogated is compelled to take a quick decision: either to tell the truth or to produce a false explanation on the spot. It is fairly hard to invent false testimony that looks logical and convincing. Therefore, in many instances the accused opts for telling the truth.

The tactics of interrogating the suspect do not differ much from those used during the interrogation of the accused. The summons and interrogation of a suspect are conducted in keeping with the established procedure. Most of the tactical methods are equally applicable to the interrogation of both an accused and a suspect.

During the interrogation of a suspect it is necessary, however, to remember that, at this stage, evidence is not complete and some of the facts are not entirely checked. Besides, not enough is known about the suspect himself. On the other hand, an interrogation often has some surprises in store for the suspect and he has less time and opportunity to choose and justify a false defensive position.

Tactics of Interrogating a Witness and a Victim. Though most witnesses wish to help justice, their testimony may be incomplete or wrong due to mistakes made at one or another stage of forming evidence. There also are witnesses who deliberately give false testimony.

All this is true about the victims' testimony as well. Therefore the law of criminal procedure provides for the same rules of interrogation for both witnesses and victims of a crime. Some tactical specifics of interrogating a victim are due to his being a direct participant in an event and therefore he may know better the circumstances of a crime. Besides, more often than not a victim is interested in the outcome of a case.

Before interrogating a witness, the investigator checks his identity, tells him his rights and duties, warns him about his duty to give truthful evidence, finds out his relationship with the accused and the victim and other necessary information about him. To have a clearer idea of the interrogated and to motivate him to give truthful testimony, the investigator may conduct this part of an interrogation as a conversation.

The tactics of interrogating a witness are used to find out how much he knows about the circumstances of the crime and the sources of his information (whether he has first-hand information about the circumstances, or he has been told about them by someone else). It is important that the witness should be helped in recalling what he has forgotten and in drawing a distinction between what he himself has seen or heard from what he imagines to be true. If the witness gives deliberately false testimony, the investigator uses tactical methods normally applied to interrogating the accused.

To make a correct assessment of the testimony provided by the witness, the investigator finds out the objective and subjective factors that may influence the formation of testimony. Among the objective factors are the time of perceiving the facts, the distance from which the witness observed an event, the situation at that moment and at the time before and after it, and other external conditions which could facilitate or, conversely, hamper perception and cause distorted impressions. Among the subjective factors are the state of a person at the time of perception (whether he was composed or absent-minded, physically fit or tired, possessed by fear, and so on), the character of perception and remembering (wittingly or unwittingly) and also the specifics and defects of eyesight, hearing and other organs of perception.

To help a witness recall what he has forgotten, it is sometimes advisable to make use of associations by asking him the difference between the situation he is describing and a normal state of affairs, and inquiring about where he was during the incident, what his reaction was, what he spoke about, what he felt, etc.

If a witness does not remember at what time of the day the event took place, he should be asked how he spent that day. This will help him recall after what clearly remembered moment the event occurred (the coming or going of members of his family or other persons, the time he performed definite work, and so on). To establish the duration of an event or the speed of movement, the witness should be asked what he was doing between definite moments.

A witness may forget the exact date of some or other event, especially if it occurred a long time before. In such a case it is advisable to ask the witness about other events of that day and specify the date by referring to other evidence.

Witness testimony associated with determining weight, quantity and other evaluations can often be specified by associated signs. In some cases a witness may be asked to describe the objects he mentions in his testimony. For instance, when asked about the weight of stolen goods, a witness may sometimes fail to say how many kilograms the stolen property weighed, but will easily remember how many bags or boxes were carried away and whether they were of standard size, and will mention other details that should make it possible to calculate the weight of what was stolen.

A witness sometimes finds it difficult to formulate his thoughts about certain characteristics of an object or about somebody's actions. In such cases it is advisable to suggest that he could express what he means by gestures, in a drawing, or in any other way. It is often helpful to ask him a question that would make him recall an object by analogy with other things he knows well (for instance, "What geometric figure does it look like?").

Recognition is the most effective method of recollecting. This quality of memory is used when the interrogated is shown photographs or other objects. The demonstration of things, documents or persons to help a witness recall the circumstances relevant to the investigation is to be distinguished from the action envisaged under the criminal procedure law and known as presenting for identification. In the latter case the witness compares a face or an object with an image he remembers and determines whether he saw it in a certain place at a definite time. The demonstration of objects can stimulate the witness's memory by helping him restore in his memory the appearance of an object and recall when, where and under what circumstances he saw it. Of course, demonstration of objects, just like any other tactical method, should not have a prompting (suggestive) effect on the witness. If the witness finds it hard to recall certain circumstances, the interrogation should be deferred to a later date, or the investigator should go over to other questions, asking the witness to inform him about the relevant facts as soon as he recalls them.

The tactics of interrogating minors are determined by the specifics of their mentality, which differs from that of adults above all in perception. A child concentrates not on everything that happens around him, but on what affects his emotions. Children are very observant, are prepared to take part in any interesting activity, and remember well what they have seen. These qualities give them great cognising power. Minors can give testimony on facts overlooked by adults. On the other hand, children are largely incapable of regarding facts critically, analysing them and seeing essential relationships between them. Their image of the real world is often mixed with fantasy.

The judgements and actions of juveniles are shaped primarily by their emotional attitude to people and events. Their desire to be grown up, combined with a lack of experience in life, causes a painful reaction when they are treated as children. An investigator who trusts a juvenile, appeals to what is positive in him, and treats him as an equal, makes him more sincere.

For a successful interrogation of juveniles it is very important that they should realise their duty to help justice by giving full and sincere testimony.

Each period in the development of minors has its own distinctive features which should be taken into account before and during an interrogation. An interrogation of a minor should be most thoroughly prepared for. The investigator should collect detailed information on his character, have a clear picture of his personality, his surroundings and people among whom he has been growing up. Depending on the data obtained, an interrogation plan is drawn up, and the time and place of an interrogation, the way of summoning the minor, and the list of other persons to be invited, are decided on.

The general tactical rule that an interrogation should be conducted as soon as possible after the investigated events should be most thoroughly observed in the case of minors. Children are easily succeptible to suggestion. The start of an interrogation should be timed so that the child would not be tired and feel well. If an interrogation is going to be lengthy, a break should be envisaged. A boy or girl aged 14 to 16 is normally questioned in the investigator's room (an official atmosphere there stresses the importance of his or her testimony). The place of interrogation for a child should not be uncustomary—it may be the school, home, or even the street where the child was playing as he was watching the event the investigator wants to know about.

The investigator must also decide who is to be present at the interrogation. An education expert should be invited to help the investigator establish psychological contact with the minor and to properly formulate questions in keeping with the child's mentality. For this purpose the tutor should be given information on the personality of the minor and be acquainted with other relevant materials. Parents or legal representatives should be invited if they are trusted and respected by the minor and can help obtain truthful testimony from him. Prior to the interrogation the investigator should talk with those who would be present during the questioning to coordinate their conduct with the general tactical line of the investigator.

It is fairly difficult to receive detailed testimony from a minor as he tells his free story, since he is yet incapable of describing events logically and fully. Therefore questions and answers take up a greater part of the interrogation. Questions should be brief and clear and concern particular details. The investigator should see to it that no leading questions be asked.

Minors can give inaccurate testimony involuntarily, or they may lie deliberately. Some may lie without any motive, which especially concerns small children. Usually, false testimony is given due to shame, fear, or misunderstood sense of solidarity, or because children are asked to do so by adults. In such cases the reason of inaccurate testimony should be established. To help the interrogated, the investigator may use such methods as concentration on detail, stimulation of remembering by association, interrogation at the scene of an incident, or demonstration of objects relevant to the investigation. Persuasion is the chief method of overcoming a minor's negative attitude. Positive results can be achieved by asking questions about accompanying circumstances and by a repeated interrogation. A minor giving false testimony sometimes himself wants to change his attitude, but does not know how to do it. Tactical methods of interrogation should help him to do just that.

Tactical Methods of Confrontation. Confrontation is an interrogation of two persons at the same time and concerning the same set of circumstances. It is conducted between two persons in whose testimony there are considerable discrepancies. The procedure of confrontation is determined in detail by the law. While the general tactical methods of interrogation are applicable to confrontation, it has its own specifics. During a confrontation its participants inevitably get to know some materials of a criminal case. An iniquitous participant (usually the accused) may try to influence the second party in a bid to make him give testimony to his own advantage. Participants in a confrontation can use it also for exchanging information. Therefore confrontation should be thoroughly prepared for. During the preparations it is necessary to decide on the list of participants and the succession of confrontation sessions (if several confrontations are to be made with one of the participants to find out the same circumstances), to determine the subject of interrogation and the order of clearing up various circumstances during each confrontation, and to formulate appropriate questions.

During a confrontation the circumstances of the case are studied separately and sequentially. Usually the first to be interrogated is the person whose testimony matches the other available information on the case and is regarded by the investigator as more trustworthy. Before an interrogation on the substance of the case the investigator learns about the relationships between the participants. The interrogated should not just say whether the relations are "good" or "bad", explain why.

The investigator may allow the participants to ask each other questions, but in doing so he should rule out any possibility of collusion or undesirable transmission of information between them.

The investigator should be attentive and patient and show tact and competence.

The use of tactical methods of interrogation in court depends on the specifics of the court investigation: an interrogation in this case is conducted at an open court session. Among the interrogated are, as a rule, persons who had been repeatedly questioned by the interrogator; judges and other persons taking part in a trial may also take part in the interrogation in the sequence established by the law.

The defendant is interrogated first by the presiding judge, then by the judges, the prosecutor, the victim, and also by the civil plaintiff, the civil respondent, their representatives, and the counsel for the defence. After that the defendant may be asked questions by other defendants and their counsels.

The interrogation of witnesses, a victim and an expert is conducted by the chairman, the judges, the prosecutor, the victim, the civil plaintiff and the civil respondent, and their representatives. The counsels for the defence and the defendants are the last to ask them questions. If a witness is summoned for a court sitting following a request of a participant in the court examination, that participant is the first to ask him questions.

The effectiveness of an interrogation of the defendant and witnesses largely depends on how thoroughly it had been prepared for. While studying the materials of a criminal case the persons concerned are to determine who, in what succession and under what circumstances should be questioned in court. One may also learn from the materials of a case the information about the personality of the interrogated and keep it in mind during the interrogation. The plan of a future interrogation should be based on a well-grounded theory concerning the amount and content of the information which, judging by the materials of the case, the interrogated may know.

During an interrogation in court the same tactical methods may be used as during preliminary investigation, with due account of the specifics of court hearing. Their main purpose should be a competent and tactically correct use of judicial evidence, taking into account the specifics of the personality of the interrogated, as well as the methods helping to specify testimony.

A distinctive feature of interrogation in court is cross-examination. The judges, the prosecutor, the counsel for the defence, and others taking part in a trial, question the interrogated in turn on one and the same circumstance with the aim of specifying, amplifying or checking his testimony. A simultaneous interrogation of several persons is a difficult matter also in tactical terms. During the interrogation of the defendant, for instance, the interrogator may simultaneously put questions to other defendants, witnesses, and the expert. The purpose of both types of interrogation is to confirm or disprove the testimony on definite facts told by the defendant.

4. Recording the Course and Results of the Interrogation

The principal and obligatory means of registering testimony is an interrogation record. When registering the testimony given by the interrogated, the investigator has, first, to write a record so that the process of putting down testimony would not affect the interrogation and, second, he has to make a full record of the testimony, word for word, if possible.

There are three ways of recording testimony: (a) simultaneously with the giving of testimony; (2) when testimony has been given; and (c) the recording of separate episodes in the course of interrogation. Each of the options has its advantages and disadvantages.

When the record is being made while the interrogated is telling his story, the investigator has simultaneously to follow the story, analyse the testimony, compare it with the available information, select from the story the information which is (or may be) relevant to the case, and make the record using the expressions typical of the interrogated. The investigator should not forget to watch the behaviour of the interrogated. It is extremely hard to perform all these functions simultaneously. Therefore, when putting down testimony, the investigator may interrupt the interrogated, which hampers free narration.

The second option of writing a record is preferable, since it allows the investigator to concentrate on the interrogation, but then he faces the risk of missing some details and circumstances in the narrative and failing to put them down.

The first two kinds of recording testimony should therefore be used during an interrogation concerning a limited set of specific circumstances. But if a large number of circumstances are involved, separate episodes should be recorded one by one, which makes it possible to use the merits of the first two methods of recording while avoiding their shortcomings.

Apart from a record, a shorthand report and tape recording may be used, making it possible to register testimony fully, objectively and accurately. They also discipline the interrogated and make him adopt a more responsible attitude to his testimony. All these methods facilitate the work of the investigator, allowing him to concentrate on the interrogation proper, which makes it more effective.

A shorthand report is not filed. After decoding it may be used as a rough version to be used for writing a record, or it may be completely included in the record, if it is arranged in keeping with the rules of writing a record.

A tape recording offers the best picture of the content, atmosphere and tactics of the interrogation. The investigator may use a tape recording both on his own initiative and at a request of the interrogated. The legislator does not require the consent of the interrogated for using a tape recorder, but the interrogated should be notified of this before the interrogation. The Soviet law of criminal procedure prohibits secret recording of testimony during interrogation.

CHAPTER XXI

IDENTIFICATION TACTICS

1. Psychological Principles of Identification Tactics

Identification is presentation to a witness, a victim, a suspect, or a defendant, of a person or an object to ascertain the presence or absence of identity. An object is identified by its characteristic signs imprinted in human memory in the form of an image or by its belonging to a group of objects.

Identification is used when the interrogated says he can recognise a face or an object he had seen and remembers their distinctive signs.

There are several psychological factors that are to be taken into account in the process.

During the presentation of an object or a face for identification, the so-called shaping and identifying processes are successively brought into play in the human mind. The former includes the mental assimilation or realisation of an image of a man or an article. The latter involves recalling them. Both processes go through several stages. Thus, in the identifying process there occurs perception of actual objects, their mental comparison with images perceived earlier, the revival of these objects in memory and the final decision on whether there is identity or not.

At the basis of identifying an object as it is presented to the viewer is the mental process of recognition.

There are two types of recollection: simultaneous (synthetic) and successive (analytical). In the case of simultaneous recollection, a person forms a judgement proceeding from his general perception of an object, without singling out some elements or analysing its inherent qualities. An example of simultaneous recollection is identification of persons and objects that were frequently seen (relatives, acquaintances, personal objects in constant use, etc.). Successive recollection is singling out and differentiation primarily of separate signs giving the general impression of an image, as a result of which a conclusion is made on whether the objects in question are identical or not.

Ability for simultaneous or successive recollection depends on man's individual mental qualities. The effectiveness of recollection is influenced by the social experience of the identifier, his will, the type of his memory, the time passed since he saw the object, and other conditions.

2. Preparations for Identification

It should be remembered that this part of investigation is often associated with considerable difficulties caused by the specific mental qualities of the identifier and the conditions in which he saw the object to be identified. The decision to conduct identification should be preceded by thorough preparations, which normally include a preliminary interrogation of the identifier who should be informed about the purpose of identification, selection of objects to be identified, and provision of conditions for drawing a comparison between objects and their remembered images. Most essential among the conditions are the place where an object is presented for identification, similarity of objects among which the required object would be placed, the lighting conditions, the position of objects in relation to each other, etc.

Specifics of the Preliminary Interrogation of an Identifier. The purpose of preliminary interrogation is to determine the following: the circumstances preceding the perception of an object; the conditions of perception; the specific features of an object remembered by the identifier; the events that took place since the time he saw it, and the consent of the interrogated to take part in identification.

The ascertainment of the circumstances preceding the perception of objects gives the investigator an opportunity to learn why the identifier was at the place of an incident, whether he saw an identified person for the first time or had known him before, when the interrogated got acquainted with that person, and how long he had observed him. It is especially important to find out during a preliminary interrogation the conditions in which the interrogated directly saw the object, because they largely influence the perception of the object, the recollection of it and the comparison of an actual object with its remembered image. Therefore, apart from obtaining information about the situation in which an object was observed and perceived, the identifier should be asked to describe the place from which he watched the object, to specify the field of view, the time of the day, the presence of additional sources of light, the distance to them, the way the object was lit, the presence of any obstacles, and the way in which they could influence observation. It is important also to ascertain the subjective conditions of perception, that is, to establish the physical and mental state of the viewer, the state of his eyes and hearing at the moment of observation, its duration, and whether he watched the object deliberately or saw it by chance. The identifier should be asked by what distinctive features and characteristics he can identify a face or an object. The more information about the distinctive features of an object he can provide, the easier it will be to individualise it. Therefore during a preliminary interrogation the investigator makes a detailed record of the testimony about the general and particular features of the object, learns about the specific qualities of the identifier's memory, and finds out whether he would be able to recognise the required object.

The tactics of interrogating the identifier largely depends on how much he is interested, if at all, in the outcome of the case, in the object to be identified and the situation in which the object was seen. If the identifier is a witness, he is, as a rule, a disinterested participant in the case, while the victim is interested in an outcome favourable to him. For this reason a victim may be determined to identify the object "by all means". The fact that a person is interested in the outcome of a case may give a positive effect when the victim tries to memorise for a long time the distinctive features of a stranger who attacked him, or it may be negative when the victim wants to fill the gaps in his perception by inventing details.

It has been noticed that the testimony of a witness on the circumstances of an incident is more precise than that given by a victim, though it may be incomplete. This is explained by the fact that a witness usually watches what is going on in a relatively calm (safe) situation, which enables him better to perceive, memorise, and then to describe, the circumstances of an incident, the features of an object, a person, etc. Most often the objects of future identification have been seen by a witness by chance.

Suspects and defendants are chosen for identification more rarely than witnesses. It may be recommended that suspects and defendants be invited for identification after they have admitted the fact of a crime, have recognised their guilt and expressed a wish to take part in this stage of investigation.

During a preliminary interrogation the identifier is asked about the general and individual distinctive features of the object of identification, such as its appearance, shape, size, colour, and purpose of an article, specific distinctions of a number plate, a brand mark, frayed or threadbare places, ruptures, scratches, various spots, etc.

When a person is to be identified, this may be done with the use of a verbal portrait. In the case of an animal, the investigator finds out its breed, sex, colour, age, distinctive marks or brands, the way it is sheared, defects of hooves, and other individual signs.

The selection of objects, one of which is to be identified, is an important element of the preparations. Under the law the objects produced for identification should resemble one another as much as possible. In the case of individuals, the identified person should resemble by the age, height, figure, the colour of the hair and eyes, complexion and shape of the face, those among whom he is placed. Besides, when selecting these persons, one should take into account their race, ethnic origin, style of clothing and the presence of the same items the identified person had with him at the time of the incident (a cane, an umbrella, glasses, etc.). The person to be identified should be shown together with other persons whose number should be not less than two (this rule does not apply to identification of a dead body). The identification of a person is far more effective if it takes place in the conditions similar to those where the identifier saw the person he is asked to recognise. For that purpose, factors that could disguise the person being identified should be eliminated (for instance, if necessary he should wear glasses and clothes similar to those worn by the criminal during the incident, etc.). Lighting should be good.

The selection of objects to be produced for identification depends on the signs mentioned by the identifier during an interrogation. If these signs can help individualise an object, then objects of the same kind are chosen (weapons of the same system, knives or bags of the same type), though they should have different particular signs. If the identifier names a general category by which an object can be recognised, then objects are chosen that fall within this category but are of different types (hand-guns of different systems, hunting guns of different models, bags differing in shape, though of the same colour and size).

Animals are presented in a group, resembling one another in the species, breed, sex, age and colour.

3. Tactical Methods of Presenting Objects for Identification

When persons are presented for identification, the following procedural rules should be followed: 1) the person being identified should be placed among persons unknown to the identifier; (2) the invited observers should not be interested in the outcome of identification; (3) if there are several identifiers, identification should be done by each of him separately; (4) the person being identified should be told about his right to take any place among the other persons taking part in the identification procedure; (5) the identifier (a witness or a victim) should be warned about his liability for evading or refusing to give testimony or for giving deliberately false testimony; (6) if the identifier has pointed to a person among those shown to him, he is asked what signs or specific features helped him to recognise that person, and when he saw him and why.

If a sign relevant to the identification is concealed under clothing or hair (tattoos, scars, warts, etc.), the person being identified should be asked to change his posture so as to give the identifier an opportunity to see the given part of the body and the sign.

If a person cannot be present, he may be identified by a photograph shown among three or more other pictures. The persons on the photographs chosen for the identification procedure should resemble the one to be identified (the same sex, age, shape of the face, posture, hair, the size of the picture, etc.). The photographs selected for identification (a front and a side view, or with the head half turned) are pasted on a single sheet of paper, numbered and marked in the corner by a stamp of the investigatory agency. The identifier is asked to examine the photographs in the presence of the invited witnesses to a search, say the number of the identified picture and name the signs by which he recognised the photographed person.

Identification of a dead body is conducted when the identity of the deceased is not known and identity documents are not found on him. Usually a dead body is identified at the place where it was discovered, in the nearest populated area, or in a morgue. When necessary, the corpse is made up or conserved. If not identified, a corpse is photographed twice according to the rules of identification photography — before the forensic-medical autopsy and after it. These pictures may be used later for identifying the dead body.

Identification of objects is conducted by showing a group of similar objects. They should be positioned in the same way (showing one and the same side), so that they would be clearly seen. Numbered tags should be attached to them, and the objects should be photographed in the sequence in which they will be offered for identification. With the investigator's permission the identifier may take the objects into his hands for closer examination and for finding the signs he mentioned, after which he should show the signs and describe them.

Identification of animals is conducted in accordance with the general rules. They are chosen from within the same species. An animal is identified either in a herd or, following the investigator's instructions, a group of animals is selected by an expert to be shown together with the animal to be identified. An animal is identified by general and individual distinctive features.

4. Recording Identification Results

A record of identification is the main way of registering the course and results of this investigatory activity. The additional means of recording the results of identification include photography, tape recording and filming. The record should contain full and accurate information on the course and results of identification: the name of the investigatory activity, the date and place of the activity, the official title of the investigator, a reference to the legal procedure regulating this activity, the names of the persons taking part in it, a confirmation that they have been informed of their rights and duties, signatures, descriptions of the articles among which the object to be identified is placed, and, if possible, a verbatim record of the testimony given by the identifier.

It is pointed out in the record that the witness (or a victim) was warned about criminal liability for refusing to give testimony or evading this and for providing deliberately false evidence. The record also reflects compliance with the rule that a set of similar objects be selected for identification, including the object or person to be identified. If persons are to be identified, the record mentions the names of each member of the group, their height, age, hair colour, features, the colour and type of the clothes, and other signs. It is pointed out that the identifier has been informed of his right to occupy any place among the persons being identified.

After the preparatory actions and when the persons taking part in the identification procedure have been explained their rights and duties, the identifier is asked to say which person among those shown to him he has recognised and why. If a person has been identified, the testimony of the identifier is recorded verbatim. The remarks concerning the identification procedure made by the participants are put down in the record. If a person or an object have not been identified, this is also registered in the record, which is then signed by the participants, including those among whom the person to be identified was present.

Photographing, video recording and filming offer an opportunity to put on record the identification procedure more fully. The investigator together with a specialist (a criminalist or a cameraman) write a plan for photography or filming beforehand, decide how the participants in the procedure are to be arranged, and choose the best way of taking pictures or filming. It is recommended that at first a general view is shown. It is necessary to photograph or film the moment when the person to be identified takes his place among others. Then a picture of the whole group is taken, and the entering of the identifier. Usually the identifier takes a seat opposite the persons he is to observe. Therefore the identifier and the person to be identified should be photographed or filmed at the moment of identification, showing their actions, gestures and reactions. If a person has been identified, a close-up picture is taken (front and side view).

If a person is identified by his gait, gestures and other dynamic or functional signs then a sufficiently large place is to be made available, so that the whole group could demonstrate the indicated signs. It is recommended that the person to be identified and those taking part in the procedure be filmed or photographed during some or other actions or in definite positions.

If during the identification procedure photography, filming or tape recording have been used, this is registered in the concluding part of the protocol, mentioning the type of the camera, video- or tape-recorder, and the conditions of photography, filming or tape recording.

CHAPTER XXII

EXAMINATION TACTICS

1. The Concept and Types of Forensic Examination

It is decided to conduct *examination* in cases when special knowledge in science, technology, arts or crafts is required for solving a problem directly or indirectly related to the case.[1]

As distinct from other ways of using special knowledge in criminal procedure (for instance, when an expert is taking part in an investigatory action, or in conducting an inspection), in examination special knowledge is used for studying various objects for making a conclusion. This conclusion, which is, as a rule, associated with assessing signs and qualities revealed during examination, is regarded as evidence and is to be checked and evaluated accordingly, on a par with other evidence.

The type of forensic examination depends on the objects to be examined and the problems to be solved.

There are several classes and types of forensic examination. The most widespread are: forensic medical, forensic psychiatric, forensic biological, criminalistic, engineering (including transport), bookkeeping, economic, and forensic commodity research.

The progress of science and technology extends the possibilities of forensic examination and brings to life new types of such examination. It is now possible to identify a person by his tape-recorded voice. The possibilities of determining the origin of various goods and materials, fuels, lubricants, and other items have greatly increased.

Criminalists has formulated tactical recommendations for a most effective use of examination in crime detection and prevention. The recommendations help the investigator to choose a type or class of examination, fix the time of carrying it out, as well as select an expert, collect and prepare the required material, and formulate questions to be put to the expert. The tactical succession of a series of examinations should be properly determined. Besides, these recommendations are used also in evaluating the examiner's conclusions and using them as a part of evidence.

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[1] The professional knowledge possessed by a limited number of experts having necessary training and experience is recognised as "special". Juridical knowledge of the criminal law, criminal procedure, etc., is not considered "special". Knowledge of crafts may be used when examining locks, instruments of burglary, weapons, etc.

It is within the competence of the investigator (or the court) to decide whether an examination is necessary. Here one should take into account not only the need to use special knowledge for the purpose, but also the significance of the relevant problem for ascertaining the substantial circumstances of the case and determining the presence or absence of other evidence related to the same matter and the reliability of such evidence. The legislator provides for mandatory examination when it is necessary to determine the cause of death, the character of bodily injuries, the mental state of a defendant or a suspect (when his sanity is called in question), establishing whether a witness or a victim is capable of properly perceiving the circumstances that are relevant to the case and giving correct testimony on them, as well as for determining the age of a defendant, a suspect or a victim, when this is important for the case, and when the papers indicating his age are not available.

Since a forensic examination takes quite a long time to perform (including the time required for sending over the materials), it is advisable to assign an examination as soon as there arises a need to clarify a question.[1] An examination may be postponed only if some materials indispensable for appropriate research are absent.

If one and the same object is to be subjected to several examinations (for instance, an axe with blood stains would require both a forensic biological examination and trace investigation), the examinations should be conducted in a succession ensuring the best preservation of the less stable traces. When determining the sequence of examinations, the investigator bears it in mind that a conclusion made by one expert can be used as initial data for another examination.

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[1] In some cases an examination is required immediately (for instance, after a road accident or industrial accident). When reports of such accidents are verified, departmental examinations are sometimes conducted, inspectors make their judgements, etc., before criminal proceedings are instituted. The materials containing the results of such examinations are often included in the materials of the case after the proceedings are instituted. But they cannot be used in lieu of an expert conclusion.

2. Preparations for and the Initiation of Examination

An examination is assigned by a decision to be made by the investigator or by a court ruling.

The decision (ruling) points out the class or type of an examination (e. g., criminalistic or forensic biological), and an agency of experts or an individual expert that will perform it. If an examination is to be carried out by an expert agency, its chief assigns an expert or several experts for the job.[1]

When appointing a specialist who is not employed by an expert agency, the investigator himself chooses a competent person, taking into account the wish of the accused, if this does not affect the case negatively.

The decision contains a brief description of the circumstances relevant to the object of examination, and the articles to be examined are enumerated and, if necessary, described. In the latter case their physical condition is mentioned, especially if reference is to fragile, perishable or partially destroyed items.

The text of the decision also lists the following: the objects associated with the event of a crime are enumerated (for instance, traces removed from the place of an incident, or a receipt that is suspected to be forged); other sample articles to be used for comparison purposes (in the case of an examination with the purpose of identification)[2]; and materials obtained by investigatory methods and containing information on the circumstances of a case that are relevant to the examination. Such data may include witness reports on the speed at which a pedestrian was moving at the time of a road accident, a physician's certificate on the health condition of the person whose handwriting can be found on relevant papers (in connection with the study of a handwriting), etc.[1]

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[1] The investigator (or judges) may name a specific expert when sending materials over to an expert agency.

[2] Such samples may be taken by the investigator (or the court) from the accused, a witness, or a victim, or be presented as materials or substances removed during examination (samples of soil, grain, etc.), or as documents removed during a search. Such samples are called free, as distinct from experimental ones (as, for instance, a text written down to the investigator's dictation). The expert has no right to collect such samples and other materials subject to examination himself. Replicas of objects, the bullets and cartridges the expert shot from a gun which he examined, are also called samples. They are attached to the expert's conclusion together with photographs and other materials.

All the materials, which are sent for examination together with the decision, should be packed so as to rule out damage or loss.

It is important to properly formulate the questions that the expert is to answer in accordance with the decision (ruling) on initiating an examination.

Questions should be formulated clearly and unambiguously, to rule out misinterpretation, and should not exceed the limits of the expert's knowledge or the range of problems dealt with by an expert agency.

In the case of a criminalistic examination, the following questions are most typical: on individual identity of objects that have left traces (for instance, identity of the shoes whose prints were found on the scene of a robbery); on whether an article belongs to a definite type or group of objects (for instance, firearms, narcotic drugs, a definite kind of gasoline or dye)[2]; on the origin of an article (place of the manufacture or storage of cigarettes, nails, fabrics, etc.)[3], and on whether some articles originally constituted a single whole (glass fragments, bits of rope, wire, pieces of a weapon, parts of a destroyed instrument, etc.).

Criminalistic examination may also be conducted for determining why a shot was fired from a gun without its trigger being pulled; the method of breaking a safe; the time, place, distance and direction of a shot; and the time when a text was written and when it was signed.

An expert may be asked what technical or organisational faults or miscalculations (in the design of a lock or an alarm device, in writing and registering documents, or in traffic control) were conducive to commission of a crime. The expert's answer to that question may be used for preventive purposes, for instance, for substantiating a representation to be sent by the investigator to an enterprise or department.

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[1] If necessary, the expert may be given the materials of the case whose study is required for research. With the permission of the investigator (judges), an expert assigned for conducting an examination may be present during investigative actions such as survey, interrogations, etc., and ask the interrogated questions pertaining to the subject of examination.

[2] It is sometimes impossible to ascertain an object's identity due to the poor state of the traces it leaves or for other reasons. In such cases, the expert merely classes it within a certain group (for instance, naming only the fashion and size of shoes). The significance of such conclusions for evidence is the greater, the smaller the group is.

[3] As regards liquids, granules and other substances having no constant shape and place, it can be determined in rare cases whether some portions of them had constituted a single whole. However, it can be determined more often whether these parts or portions are similar in composition, structure and other qualities.

The interaction between the investigator and the expert are not limited to assigning an examination. The investigator is recommended to consult the expert well in advance concerning the possible results of a given kind of examination, find out what materials and information should be sent for examination, and specify the relevant questions. It is necessary to learn also if a repeated survey of the scene of the crime with the participation of an expert or if investigation experiments would be necessary. The expert, for his part, may inform the investigator about the preliminary results of his research, which may be used in investigation, if necessary, even before the examination is completed.

A complicated examination may be done by several experts. It is sometimes necessary to invite several different specialists to clarify a circumstance by using the data of various sciences. In this case each expert performs his part of research and makes a conclusion on that part on his own behalf, or a so-called composite examination is carried out, during which each expert studies an object by using the data of a corresponding science and then the common view of all the experts on a given question is formulated in the conclusion. The limits of the experts' competence will not be exceeded only if they all have sufficient knowledge with regard to the circumstances which they examine.

Composite examination is normally used when studying the traces of cold steel or other objects on a man's body and clothes (forensic medical and traceological examination), injuries occurring in traffic accidents (engineering and motor research and traceological examination), etc.

3. The Expert's Conclusion and Its Assessment by the Investigator (Court)

On receiving the decision from the investigator (court's rider), the expert makes sure that the task set to him is within his competence. Otherwise he should report in writing to the appropriate expert agency that he is incapable of making a conclusion.

If the materials he receives are insufficient for conducting research, the expert or the head of an expert agency should report that it is impossible to make the required conclusion and point out in detail what additional materials should be sent in.

In some cases, the expert cannot achieve a definite result, even though he has used all necessary means and methods (for instance, he fails to establish a man's identity by a smeared or incomplete fingerprint). In this case he gives a well-grounded conclusion, explaining why identification is impossible.

The expert himself decides what methods and means should be used in an examination. He has no right, however, to rely on methods that will damage or destroy the items to be examined. If he cannot accomplish his task without damaging or destroying an item (or its part), he should receive the consent of the investigator (court).

The expert's answer, definite and categoric in form, may be positive ("This paper was signed by so-and-so"), or negative ("The prints were left by a different type of shoes").

In unfavourable conditions, e. g. when there is not enough material for research or the traces are not sufficiently clear, the expert formulates his conclusion as a probable, but not categoric, judgement. It cannot serve as the basis for a judgement.

In the introductory part of the conclusion submitted by the expert in writing, he indicates the name of the expert agency, his own name and qualifications, the case for which an examination was made, and the establishment that assigned the examination.

Then he describes the materials presented for examination and enumerates the tasks set to him.

In the research part, the conclusion contains the data obtained during the visual examination and study of the objects, a description of their state and specific features, and the results of comparisons, analyses and experiments. Then all the results are assessed and, on that basis, the conclusion is made.

The conclusion should be clear and unambiguous and directly answer the questions put by investigator (court).

If during his research the expert discovers circumstances relevant to the case, but which he was not asked about, he may mention them in his conclusion. In this case the expert should not exceed the limits of his competence.

He attaches to the conclusion addressed to the investigator or the judges the following:

(a) all the studied materials (real) evidence, other articles, samples given by the investigator and those prepared by the expert himself);

(b) illustrative materials such as photographs and, if necessary, X-rays, spectrograms, and so on.

The expert's conclusion is assessed as evidence by the court (investigator) according to general rules.

The first thing to be checked is whether all the requirements of the law of criminal procedure have been met when assigning and conducting an examination—i. e., whether the examination pertained to the initiated criminal proceedings, if the procedure of assigning the examination was in keeping with the regulations, whether the inspector was impartial to the outcome of the case, if he was competent enough, whether the rights of the defendant were observed when assigning the examination, and whether the expert was warned about his liability for refusing to make a conclusion, for evading making it, or for providing a wrong conclusion deliberately.

Then it is checked if the materials mentioned in the decision (ruling) on conducting an examination correspond to the materials described in the expert's conclusion.

It is determined whether these materials are sufficient and if the expert's request for additional materials has been fulfilled. It is also checked if the answers provided by the expert correspond to the questions put to him.

Special attention is given to whether the conclusion is grounded and follows from the results of the research made.

It is necessary to check, if possible, whether the research is complete and if the expert used modern and effective means and methods of research.

The facts cited in the expert's conclusion are compared with the data obtained from other sources of evidence relevant to the case.

The objections of the accused to the judgements made by the expert, if they were expressed when the accused was being familiarised with the expert's conclusion, must be thoroughly studied.

The investigator has the right to interrogate the expert with the purpose of clarifying or enlarging his conclusion. If the conclusion is not sufficiently complete and clear, another examination may be assigned, which is often (though not necessarily) entrusted to the same expert.

A discrepancy between the expert's conclusion and the actual circumstances of the case may cause grounded doubts in its correctness.

Such doubts give the investigator (court) grounds for calling another examination of the objects once examined.

A repeated examination may be assigned also if the law of criminal procedure was violated considerably when assigning and conducting an examination.

The decision cites the motives for another examination, apart from mentioning the usual data. That examination should be performed by another expert, most often by a commission of experts.

PART FOUR

METHODS OF INVESTIGATING INDIVIDUAL TYPES OF CRIMES

CHAPTER XXIII

GENERAL METHODOLOGY OF CRIME INVESTIGATION

Methods of investigating crimes, like crimes themselves, are all different. Meanwhile the unified requirements of the law, the common purposes of investigating crimes of a similar kind, similar methods of committing crimes, and typical material and other traces of a crime make it possible to single out general methods of investigation that are characteristic of a definite group of criminal cases. The study and scientific generalisation of the practice of investigating crimes of the same kind enable us to suggest a set of general, most effective methods. Apart from the specific features of investigating crimes that fall within some or other type (group), there exist common principles which should be observed when investigating all kinds of crimes, whatever the circumstances in which they are committed. Some of them are obligatory and are formulated in the criminal procedure law (e. g., the rights and duties of the participants in criminal proceedings, the procedural rules of investigative actions, the procedural time limits, etc.). Others are criminalistic recommendations which should be applied as the investigator thinks fit, irrespective of the type or individual specifics of the crime. Among these are general methods of detecting, registering and studying the material traces of a crime and general tactical methods of carrying out individual investigatory actions. Being universal, they become common principles of investigation.

Besides, there are general principles concerning not individual methods of detecting and studying the traces of a crime, not the tactics of investigatory actions, but rather the general methodology of investigation. These general principles are applicable to the investigation of individual types of crimes.

The general methodological principles of investigation reflect the general methodological requirements applicable to criminal investigation. So, the principles of criminal procedure, the general conditions (principles) of preliminary investigation, and the general methodologies of investigating individual types of crimes are classed into three separate categories. The general principles of the methods of investigation are in a subordinate position with regard to the principles of criminal procedure and the general conditions of preliminary investigation; they are based on them and should never contradict them.

The general principles of crime investigation methods are: strict and unswerving observance of the law; planning; efficiency and quickness; effective use of crime detection and investigation and scientific methods and technical means.

Observance of the law is the general legal principle. It underlies the entire criminal procedure, all its stages, and all the activities of the court, the prosecutor, the investigator, the counsel for the defence, and other participants in a trial. In the Soviet Union, the principle of legality during preliminary investigation means strict observance of the Constitution and the rules of criminal law, criminal procedure, administrative and other branches of law.

Strict and unswerving observance of the law as a principle of investigative methodology means not just strict observance of the procedural rules applicable to preliminary investigation, but also a correct use of tactical, as well as scientific and technical, methods of investigation. It should be stressed once again that no method of natural sciences, no technical means and no tactical method can be used unless they correspond to the spirit and letter of the law of criminal procedure.

The legality principle is applied also in the assessments made by the investigator. Receiving a criminal case, the investigator or the person prosecuting an inquiry thoroughly studies, analyses, compares, and assesses all the available material. During investigation he obtains new facts and each time he assesses them from different points of view, judging whether there are enough grounds for instituting criminal proceedings, bringing an accusation against somebody, choosing preventive measure and other procedural measures of coercion, whether the planned procedural actions are grounded enough and the evidence is relevant and admissible, whether investigatory theories are justified, whether the facts revealed during the investigation can be used as evidence, whether the results of expert examination of real evidence are proved scientifically, etc.

The main conclusions the investigator arrives at as a result of assessment concern the investigated action as a whole. It is essential to give a correct legal assessment of a crime. Such an assessment includes not only classification of a crime in keeping with the criminal law, but primarily a decision whether the incident is a crime or it is a misdemeanour punishable in an administrative way or under the civil law; whether the action has ceased to be socially dangerous because the situation has changed; whether it presents social danger because of its insignificance, and if there are grounds for waving criminal liability. Assessment of an incident by legal criteria is decisive for determining the type of punishment and specific form of liability.

The planning of investigation is an important principle of crime investigation methodology. Preliminary investigation according to a definite plan makes investigation quicker, fuller and more comprehensive. Planning makes the investigator's work better organised, more purposeful and effective, and ensures timely and successful cooperation of the investigator and the operative worker. Without a plan, the investigator spends his time irrationally, sometimes taking irrelevant actions, and achieves a result too late, which makes it less effective.

Efficiency and Quickness of Investigation. Criminal investigation should be done quickly and effectively. Quickness and efficiency are similar, but not identical notions.

Quickness implies an optimal rate of investigation, when the best results are achieved within the briefest span of time.

Efficiency implies a competent and coordinated use of all procedural and detection means to investigate crimes as rapidly as possible. To act efficiently means correctly to assess a situation, to take quick and adequate decisions, and to carry them out in time.

Efficient investigation helps to quickly detect traces of a crime, to find and apprehend a criminal, ensures the effectiveness of criminal punishment, increases its preventive effect and ensures the compensation of the harm caused by a crime. Sluggishness in taking planned actions gives the perpetrator an opportunity to conceal the traces of a crime and hide valuables and accomplices, and makes the compensation of damage caused by a criminal action difficult or impossible.

The Effective Use of Crime Detection and Natural-Science Methods and Technical Means in Investigation. Practice has shown that successful investigation is possible if not only legal means, but appropriate crime detection methods are duly used.

Combining legal and crime detection measures is an indispensable condition of effective crime investigation. The investigator should always maintain effective contacts with crime detection personnel. The main condition of their cooperation should be delimitation of their competence according to the law.

The crime detection, scientific and technical teams should effectively use their own means and methods for a complete and rapid disclosure of a crime and carry out the investigator's instructions in a timely and efficient way. They must immediately inform the investigator and the procurator about a detected crime when preliminary investigation is obligatory, take urgent measures to guard the scene of an event, find and preserve real evidence, organise a search for the criminal while the traces are fresh and perform other investigatory and detection actions without delay; provide scientific and technical assistance in spotting and preserving the traces of a crime; and timely to report to the investigator on newly received data to be used in the preparations for, and conducting of, investigation.

For his part, the investigator seeking to ensure a proper combination of investigatory and crime detection actions, informs crime detection and operative workers about the results achieved in carrying out the investigation plan and about new data that can be used for a better organisation of crime detection operations; gives clear and timely instructions to operative workers on taking necessary actions to ascertain the identity of the suspect (the accused), of his acquaintances, way of life, his conduct at work and at home, and to find witnesses to the crime and other witnesses; and invites operative workers to take part in preparing and effecting the apprehension of the accused or the suspect, for making searches and taking other actions involving the risk of the criminal's resistance, escape, suicide, and destruction of real evidence.

The investigator, using crime-detection data on the object of a search, on the places used for hiding instruments of crime and stolen property, on the location of hiding places, and on the criminal's conduct before detention, can better prepare the required investigatory actions, conducting them rapidly, effectively and unexpectedly to the criminal. A combination of investigatory and crime-detection actions can also help prevent crime.

The investigators, for their part, can be of great help to operative workers by revealing data which can be used for effective crime-detection actions. These data may concern a planned crime, the ways and means of committing it, the objects of a contemplated criminal offense, ways of disguising criminals, methods of covering traces, arranging hiding places, supposed places of illegal gatherings, ways of maintaining contact among accomplices, and the facts characterising the persons likely to commit crimes. During the interrogation of the accused and witnesses while carrying out other investigative actions, the investigator finds out such data and immediately reports them to the operative personnel.

The effective use of natural-science methods and technical means largely increases the chances of detecting and examining evidence, making it possible to expose dangerous criminals, discover real evidence which cannot be found by other means, and study it. The means and methods of forensic photography, ballistics, traceology, criminalistic study of documents, criminal's registration, determining a person's identity by his described features, as well as forensic medicine, psychiatry, biology, chemistry, physics, psychology and other natural and technical sciences can be used effectively in investigating crimes.

The use of scientific and technical means and methods in criminal investigation should not be confined to forensic examination. Expert research should be combined with other scientific and technical means and methods of crime detection and investigation.

CHAPTER XXIV

THE DESCRIPTION OF CRIME IN CRIMINALISTICS

1. The Concept of the Criminalistic Description of the Crime

A crime, when viewed as a negative social phenomenon, can be described from different points of view: for instance, from the sociological, criminological, criminal-cum-legal, psychological, ethical and criminalistic viewpoints. Specialists of various disciplines who study a particular crime or a particular type or group of crimes, as well as crime in general, are confronted by specific tasks and they investigate those specific features which characterise the content thereof from the point of view of the realm they work in. Thus the representatives of the science of criminal law study the material elements of the crime (*corpus delicti*) and other indicators relating to the criminal law (namely, the circumstances facilitating the individualisation of the punishment; those which affect the choice of type and measure of punishment and the conditions under which it will be served). Meanwhile, the criminologists will be interested in the reasons for, and the structure, content and dynamics of, the crime.

The criminalistic description of crime is in itself the totality of such information of the crime which facilitates the detection thereof. It includes information as to the special preparations for, the execution of and the concealment of the crime, the use of which assists the more successful, full and speedy detection thereof. Thus, if the investigator has at his disposal information about the typical methods of committing and concealing crime — the sort that are often used by criminals these days and which hinder the use of criminalistic techniques — then it is much easier for him to discover a crime; at the same time, his activities in the detection of real evidence and identification of the criminal will be more purposeful and successful.

The criminalistic descriptions of crime differ from those used in criminal law, for example, in that they are not intrinsic to a general concept of the crime. Criminalistic descriptions are applied to a particular type or group of crimes, and also to certain individual crimes, but not to crime in general. Criminalistic descriptions of crime do not flow from a concept of crime; rather, they accumulate on the basis of studying and generalising the material about crimes, and they express typical criminalistic features of different types (groups) of crime carried out during a particular period in a defined region or in the country as a whole.

The criminalistic description of a given type (group) of crimes is the product of scientific analysis and the generalisation of significant empirical material which is of sufficiently good quality and which adequately represents the crimes concerned for the relevant evaluations and deductions to be precise, complete and practicable.

The criminalistic description of a given type or group of crimes is a dynamic categorisation thereof. The particular content of the specific criminalistic characteristics of the crime changes in accordance with the alterations of the corresponding means and methods of criminal activity. Thus the more concocted the means of committing and concealing the crime, so too change the goals and motives of the criminal activity, the objects of that criminal infringement, the reasons and conditions facilitating the perpetration of such a type or group of crimes, and so on. Accordingly, the particular descriptions of the crime also change. Contrary to the characteristics provided for in the criminal law, the changes of which take place relatively slowly and only at the will of the legislator, the criminalistic elements of a particular type of description of crimes change significantly more quickly; they are indeed more mobile. Therefore the criminalistic characteristic of the type of crime is not a stiff and unchangeable accumulation of definite information about the group or type of crimes; rather, it is a mobile category reflecting the significant criminalistic specifics of the crime in a particular period. In order for the criminalistic description to successfully carry out its role, in order for it to facilitate the detection of crime, it should not only be workable and sufficiently complete, but it should also be modern, so as to reflect the results of a criminalistic analysis of crimes committed in the most recent period.

In defining the criminalistic characteristic of a crime as the complete set of evidence with which it is possible to detect that crime, it must not be forgotten that information relating to the criminal law, criminological, psychological and other forms of describing crime may also be used in the successful disclosure of crime. Thus some of the information obtained as a result of criminological analysis and used for crime-prevention purposes is also taken into account in the disclosure of crime. For example, the criminological characteristics of murder indicate that the majority of these crimes are committed while under the influence of drink or drugs, and 90 per cent of them as a result of hooliganism. On average, those involved in rapes are 26-27 years old, and almost two-thirds of them are unmarried. In the investigations of murders and rapes, such information about the criminological characteristics must naturally be taken into account when formulating versions of the crime in relation to the criminal. If, on the basis of criminological characteristics, the investigator concludes that a crime was committed by a person while under the influence of drink or drugs, and if this supposition is not refuted by other information, it must nevertheless be verified. In just such a way, the verification of a theory of a rape — supposedly committed by someone who is approximately 26-27 years old and, possibly, unmarried — may hasten the identification and arrest of the criminal concerned.

This poses the question whether one should or not include those criminological, criminal-cum-legal and other elements into the constituent parts of the criminalistic characteristic of a crime, if indeed they may be used for the purposes of detecting that crime. The answer must be no, for otherwise the criminalistic characteristics would to a certain extent duplicate and substitute other forms of describing the crime.

On the question of criminal-cum-legal, criminological and criminalistic characteristics of crime, different points of view have been published. Some authors identify these classifications as one, including into the criminalistic characteristic a number of other items of circumstantial evidence, including information about the social nature of the danger of such a crime, about how widespread it is, about the object of the crime and the reasons for the latter. It is well known that all these elements relate to the criminal-cum-legal and criminological descriptions of the crime. In the above interpretation the criminalistic characteristic repeats the criminal-cum-legal and criminological descriptions and in this way loses its individual sense and meaning. To substitute the criminalistic characteristic for the criminal-cum-legal one is even more inadmissible. It is unacceptable from the theoretical point of view, and in practice it would cause an illegal extension of the sphere of criminal responsibility. And such a danger would not only occur when a substitution in the criminal-cum-legal characteristics affects the necessary elements of the contents of the crime, but also in those instances when a substitution of auxiliary criminal-cum-legal concepts takes place. This will be explained in an example about the criminal-cum-legal concept of explosive substances, the infringement of the laws for storing, using, stock-taking and transferring of which is a punishable offence.

In the commentary to the Criminal Code, it is said that any chemical compound or mixture which explodes when ignited, struck or detonated shall be termed an explosive substance. The criminalistic characteristic of any explosive apparatus used with criminal intent is the fact that those materials which have the property of spontaneous combustion and/or which explode when the volume or mixture reaches criticality, may be used in the cartridges of such explosive devices. For example, when calcium or magnesium carbide is mixed with water in an enclosed container, an explosion takes place; such a result can also be obtained by adding potassium magnate or glycerine to sulphuric acid. One only has to substitute the criminal-cum-legal descriptions of explosive substances by their criminalistic ones — that is, one only has to include in the concept of explosive substances those other chemicals which have the property of spontaneous combustion and/or spontaneous explosion when the volume or mixture reaches criticality — and then one has a basis for submitting to criminal responsibility all those who keep potassium magnate, glycerine and/or sulphuric acid in their homes. It is, of course, obvious that such a "basis" for criminal responsibility is unacceptable. And this confirms the necessity to precisely differentiate the criminalistic description from the criminal-cum-legal and other forms of describing crimes.

In various publications, one sometimes comes across the established idea that an object of proof in a criminal case relates to the elements of the criminalistic description of the crime concerned, and that this criminalistic characteristic supposedly determines that object of proof, and so becomes a basic methodology of investigation.

An object of proof and a particular criminalistic description are quite different concepts. The concept of an object of proof relates to the theory of judicial proof and expresses the necessary accumulation of the existing circumstances subject to proof in the given criminal case. The criminalistic characteristic of the category of crime, however, pertains to the theory of the crime and it represents the sum-total of all the significant criminalistic information for the given group or type of crime. There is a definite link between the object of proof and the criminalistic description of the crime. It is analogous to the relationship of the theory of evidence and the theory of the crime, but by no means it is characterised by the relationship of the part and the whole, and even less by the identity relationship. An object of proof is not an element of the criminalistic characteristic of the crime. The law of criminal procedure is the basis for defining an object of proof in a criminal case, and the criminal-cum-legal description of a crime, and the rules of criminal law which define the concrete elements of various crimes. The criminalistic characteristic of crimes cannot claim to play such a part.

Underlining the important significance of the particular criminalistic characteristic of the crime concerned in the elaboration of the techniques and tactics and methods of disclosing crime it would not be correct to affirm that the criminalistic description of the crime forms the basic methodology of the investigation. The criminal law and the law of criminal procedure, and the contemporary facilities of the natural, technological and social sciences define the level of development of criminalistics detection and they form the basis of the methodology of crime investigation. It is the criminal law and the criminal-cum-legal description established by law which define both the means by which the investigation must be conducted and the elements of information about the content of the crime in question which must be established in the criminal case. In the definition of the line of investigation and the tasks thereof, it is this which is important.

The methods and means for establishing the material elements of the crime are determined by the law of criminal procedure; the latter regulates in detail the entire legal investigation and it establishes strict criteria for the admissibility of tactical methods for conducting same. The criminalistic description of the crime plays an important role in the elaboration of a methodology of investigation, but in comparison with the criminal law and the law of criminal procedure, it is nevertheless just an auxiliary role.

As a scientific category of criminalistics, the particular type of criminalistic description of the crime has a great significance, not only for the methodologies of investigation of different forms of crime, but also for criminalistic techniques and for the investigatory tactics. The criminalistic equipment, the tactics for the disclosure of crime and the tactical methods used in the investigatory activities are being developed by taking into account the various forms of criminalistic descriptions and information about contemporary particularities of criminal activity; the methods and resources of the latter are forever changing, and the criminals are endeavouring to adapt to these changing circumstances and to use ever more cunning, secretive and reliable exploits.

Criminalistic descriptions facilitate the disclosure of typical particularities of the preparation, perpetration and concealment of given groups (types) of crime, and in this way they help to find the most effective tactical methods and technical means for same.

2. Elements of the Criminalistic Description of the Crime

As was pointed out earlier, criminalistic description contains elements which lie beyond the confines of criminological, criminal-cum-legal and other forms of describing crime. In comparing these elements with those of, for example, the criminal-cum-legal descriptions of a crime, it becomes obvious that the former are as it were more "soft" and secondary in nature (these might include information about the sort of material traces which are often left behind as the result of the perpetration of a given type of crime, or details as to where they may be situated, and so on). But this is only in relation to the criminal-cum-legal aspect of the committed crime and to the individualisation of the punishment. For the actual disclosure of crime, such supposedly secondary elements acquire an important significance and sometimes become the key factors in the detection and conviction of the criminal.

Different elements of criminalistic descriptions of different types or groups of crime are correlated in different ways. For example, in criminalistic descriptions of premeditated crime, an important element is the accumulation of evidence which characterises the means by which the perpetration of the crime was prepared: the acquisition and preparation of the necessary weapons and means, the initiation of measures well in advance for hiding any traces of the crime, the involvement of others in the criminal activity, and so on. This is not, however, a feature of criminalistic descriptions of the crimes committed because of negligence. In the disclosure of premeditated murders, the criminalistic element such as the accumulation of evidence about typical traces left behind on the scene of the crime has great importance. In the disclosure of some other premeditated crimes, for example, of those carried out by public servants, it is less significant; but criminalistic descriptions of those traces which relate to misappropriations detected in different documents about the productive, technical, financial accounting, transport and other operations of enterprises, are of primary importance.

In such a way, the significance of this or that element of a particular criminalistic description of a crime is conditioned by the role it plays in the disclosure of a given group of crimes.

The elements of criminalistic description of the crime are always diverse. It is not possible to give an exhaustive list because it is changeable, as are indeed the very practical activities of criminals. We must therefore limit outselves to a list of only the general and typical ones.

The criminalistic description of crime discloses, first of all, the *typical criminal situations* applicable to a given type or group of crimes. The practical experience acquired over many years of disclosing crimes of murder has revealed a series of criminal situations which can be characterised by the particularities of the corresponding investigation: murder with firearms which is then disguised as suicide, murder with a bladed weapon, murder with the dismemberment and concealment of the corpse, murder during the course of a fight with the use of different types of objects and weapons (sticks and stones, etc.), murder in the home and in uninhabited places, and so on. The revelation of typical criminal situations facilitates the correct choice of technical resources and tactical methods of investigation, as well as of the most speedy disclosure of the crimes.

General information about particular items which are the objects of law-breaking is also significant in criminalistics. For instance, information about products, goods and/or materials which are most keenly sought in a given period by thieves and bands of robbers, helps the investigator to identify the source from which they were obtained, thus to expose the accomplices in crime. This information is not essential for the criminal-cum-legal description of the majority of crimes, nor is it required as a qualification of a particular action; it is, however, a vital element in the criminalistic description of crime.

The accumulation of that information which explains how crimes are committed is an important element of the criminalistic description of crime. As is well known, in a whole series of circumstances concerning the material elements, it is a necessary element in identifying the objective aspect of the crime, and it is also a part of the criminal-cum-legal description (different classifications of robbery, theft and burglary, for instance, may be involved: there is, for example, the stealing of property in secret and the stealing thereof openly; there is robbery with violence endangering life and health, and robbery with the threat of such violence; there is the acquisition of property through deceit, misuse of trust and/or swindling, and so on). Sometimes, the means by which a crime is committed is a qualifying condition of that crime (thus, robbery with violence endangering life and health is in itself a form of robbery which involves a more severe punishment). Certain means of committing a crime, although not foreseen in the circumstances by which that crime is designated, nevertheless form a part of those circumstances; sometimes, indeed, they may be aggravating circumstances (when in committing the crime, excessive cruelty or mockery is inflicted upon the victim, or when a crime is committed in conditions of a social calamity or danger). On many occasions, the means by which a crime is committed is not indicated in this or that article of the Criminal Code; it is nevertheless taken into account by the court when determining the severity of the punishment, and it therefore has a Criminal-cum-legal significance, and it becomes an element in the criminal-cum-legal description of the crime.

A description of the means of committing a crime does not only have a criminal-cum-legal significance. In the criminal-cum-legal description of the crime, the means by which it was committed are presented in just a general sort of way (this includes the means by which open and secret robberies were carried out, forcible entry and so on); this description does not give any specific methods of unobserved theft, and forcible entry, nor does it indicate particular technical means, the source from which they were obtained, and so on. However, the way in which the crime is committed has always a concrete character; there may be several aspects to methods and means which are of little import from the criminal-cum-legal viewpoint, but they have a vital significance as far as criminalistics is concerned. They include the following:

— how widespread are the said means of committing the crime;

— which particular methods are involved in their employment;

— which technical and other resources are used therein, and how in particular are they put together; and finally,

— which methods are used in preparing and committing the crime.

All of these are included in the criminalistic description of the means of committing a crime. In some material elements of the crime, the means by which the crime was committed does not have any criminal-cum-legal significance at all, but in the criminalistic description, it remains one of the important elements.

In many instances, the means by which a crime was committed represent in themselves the entire system of actions involved in the crime, along with all their numerous components. Included therein may be information as to:

— how the crime was prepared;

— how training exercises were carried out;

— how and where the necessary weapons of the crime and other technical means were prepared or adapted for use;

— from which sources they were obtained;

— which defects in guarding such means facilitated the supply of them to the criminals;

— which technological processes, equipment and materials were used in preparing same;

— how they were employed in the perpetration of the crime, and so on. All of this information must also be included in the criminalistic description of the crime.

From the criminalistic point of view, a crime is characterised, not only by indications as to its specific nature, but also by definite changes in the material scene in which the crime was prepared and committed. Various traces, weapons of the crime and other objects — quiet witnesses of all that has taken place in the preparation and documents of the crime — are often left behind on the scene of the crime. It is all future traces evidence for the criminal case concerned. In a number of instances, traces and other real evidence of the crime can be found in various documents (false accounts, receipts, etc.) and other written documents (financial, bookkeeping, accounting, technical and other documents), the latter might, for example, be evidence of a theft. Each type or group of crimes differ in their material consequences, and the generalised information thereof has a great significance in disclosing crime. Therefore, *the accumulation of information about the particularities and locations of the material traces of a crime* are an important element in the criminalistic description of a crime.

In criminalistic work, great importance is attached to the consequences of a crime. It is well known that this element of an objective aspect of the crime has an essential significance for defining the offence performed, and for determining the scale of criminal responsibility. The offender's psychological relationships with the actual or expected consequences of the crime determine the form of his guilt; in some *corpora delicti* the consequences of the crime are its qualifying feature. The actual consequences of the crime are characterised, apart from their criminal-cum-legal nature, by criminalistic aspects. The *accumulation of evidence of typical and actual consequences of this or that group or type of so-called physical crimes* is a necessary element of their criminalistic description.

The analysis of investigations shows that some crimes, especially those committed by gangs, are sometimes linked with other criminal activities, for example, the theft of firearms. The criminalistic description of these typical criminal links is important for the methodology of the investigation insofar as general information about similarly linked activities facilitates fuller and deeper disclosure of the crime, as well as the identification of all accomplices.

For the successful disclosure of a crime, it is also necessary to set out general information about:

— *the methods of concealing the crime, and the arrangement of the hiding places;*

— *the preparation and/or acquisition of false documents;*

— *the illegal communications between the accomplices in crime;*

— *the typical methods used, either to block the use of criminalistic technology, or to harass the search dogs; and finally,*

— *various methods of disguise of criminals.*

Information about the means of illegal communications and the methods of disguise have a special significance in the disclosure of the activities of criminal gangs. In such work, general information about the criminalistic aspects of the collaboration in crime is very useful; and in particular, information about the following may be successfully deployed:

— the structure of the criminal gang, and the distribution of roles amongst the various members;

— the methods used in involving such members in criminal activity;

— forms and methods of communication;
— the means by which secrecy is maintained;
— the conditions for their being in hide, and so on.

Information about all these circumstances must also be an integral part of the criminalistic description of the crime, for the successful disclosure of gang crime depends to a large extent on the criminalistic description of the participation of its members.

As is well known, a criminological investigation studies the personality of the criminal concerned, and a lot of typological information on this subject is an element of a criminological description of a crime. However, the frameworks for the crimminological study of the personality of the criminal are limited to those particular personal characteristics which are necessary for use in preventing crime. These are, mainly, the "professional" experiences of the criminals, for example, the experiences of the pick-pocket and/or the counterfeiter. These experiences are manifested in particular ways and means of committing crime, and they leave behind the definite "signature" of the criminal on the scene of the crime. Other small pieces of evidence may also be detected on the scene of the crime; they not only shed light on the "professional" experiences of the criminal, but also highlight other personality traits: cruelty, ignorance and so forth. This may be observed in a murder case, for example, when the criminal resorts to a particularly cruel way of committing the crime and then, supposing that his face is imprinted in the victim's eyes, he puts the latter's eyes out. All these *personal idiosyncrasies of the criminals* have a special significance for the search and should definitely be included in the criminalistic description of the crimes.

Information about the most common motives and aims for a particular group or type of crime is also an element of the criminalistic description of crime. In certain cases, the motive and aim clearly identify the subjective aspect of a premeditated crime (for example, the motive of financial gain through the misuse of power or the abuse by a civil servant of his position; or the aim of illegal profit by the preparation of false coinage or paper money). They are grouped into separate material elements of the crime, as the signs with which to designate or mitigate its circumstances (for example, motives of hooliganism, and the aim of covering up another crime by committing a skilled murder). Certain motives are enumerated in criminal law, either as aggravating or as mitigating circumstances (for example, as a consequence of a coming together of difficult personal and family situations, or when under threat or compulsion, or when in the power of physical or obligatory dependence, the guilty party commits a crime for financial or other base motives). In such cases, the motive and aim form the elements of the criminal-cum-legal description of the crime. However, in the majority of cases of premeditated crime, these elements are not a required part of the subjective aspect of the crime, and accordingly are not included in the criminal-cum-legal description. However, in every case, the motive and the aim must be identified during the course of the investigation. This is important, not only for when the court determines the punishment for the deed done, but it also facilitates a full disclosure of the crime. Information about the most common motives and aims of this or that type or group of crime is used in the theories of the crime in relation to the subject and the subjective aspect of the crime; it is also used to advantage in the organisation of a purposeful search for the criminal. Practical experience in investigating crimes suggests that in a number of instances, the goal of arson is to conceal a theft. Accordingly, in investigating a fire in a department store, for example, the verification of a theory of arson committed to conceal a theft may put the investigator on the track of the criminals and enable him to disclose their criminal activities to the full.

It follows that information about the most common motives and aims of the crime which are not elements of a criminal-cum-legal or criminological description must be included in the criminalistic description of the crime. An element thereof must also include criminalistically important *information about the typical conditions which enable a particular type or group of crimes to be committed.* The information identified in each criminal case attracts the attention first of all of the criminologists who can then plan certain measures of a preventive nature. From the criminalistic viewpoint, however, these conditions are also important in so far as they help in disclosing the means by which the crime was committed, and explaining the ways in which the criminals used the particular local conditions for the purposes of carrying out their criminal intentions.

The criminalistic description of a crime also has an aspect relating to the victim. Information about the behaviour of the victim often helps understand the circumstances of the crime and the reasons for why it was committed; moreover, they facilitate its successful disclosure. At the level of a particular type of criminalistic description of a crime, general information about the victim has a special significance. The following information can be successfully used in examining the investigatory theories of the crime and in planning the line the investigation will take:

— about the behaviour of victims in typical criminal situations;

— about the way they act so as to attract a particular form of reaction;

— about the links between the conduct of the victims and the criminal acts of the accused;

— about the characteristic objective phenomena in the victims' behaviour prior to when the whole thing started, and during the execution of the crime; and finally,

— about the traces and other changes to the circumstances on the scene of the crime, etc.

Therefore, *those components which are typical of the behaviour of victims in criminal situations* are another necessary element in the criminalistic description of crime.

Elements of the criminalistic description may even be information about certain other particulars of the preparation, execution and concealment of the crime if that information can be successfully used in the disclosure thereof. It must therefore be emphasised yet again that those elements which form the criminalistic description should not be duplicated in the criminal-cum-legal, criminological or other forms of description of the crime. The greater and more detailed the presentation of criminalistic elements in the criminalistic description of the type of crime, the richer and more valuable will be the description for the practical purposes of crime investigation.

CHAPTER XXV

THE INVESTIGATION OF THEFT IN ENTERPRISES, ORGANISATIONS AND DEPARTMENTS

1. The Criminalistic Description of Theft in Enterprises, Organisations and Departments Committed by Public Servants

Investigations into theft in enterprises, organisations and departments fall into two categories:

— thefts involving stealing, burglary, robbery with violence, extortion or swindling;[1] and

— thefts committed by public servants (i. e., crimes related to their work). The latter involve those who misappropriate valuable goods and/or money which are under their authority (either in their accounts or under their custody), and such theft is characterised by the fact that their entry into those places is legal.

The criminalistic description of thefts committed by public servants contains information about the following:

— the personalities of those who so misappropriate;

— the stolen property;

— the aims and motives of the robbers;

— the means by which the thefts were prepared, executed and then concealed;

— the circumstances in which these crimes were carried out;

— the material traces;

— the results of the crime; and finally,

— the relation of the crime committed by the public servants to other crimes.

Practical experience in the investigation of occupational crimes indicates that theft is usually committed by gangs: groups consisting of a few public servants, or groups of both public servants and outsiders. Thefts committed by just one public servant also take place.

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[1] The methodology of investigating stealing, burglary and mugging with violence is examined in Chapter XXIX.

A group of misappropriators usually include the following:

— public servants in one particular enterprise; or

— public servants and ordinary workers of just one enterprise; or

— public servants of various enterprises belonging to one or various state departments; or

— public servants and ordinary workers of several enterprises (departments or organisations).

The misappropriators may in the course of their work be involved in the production, storage, transport, treatment, supply, sale, accounting, guarding or distribution of such material goods.

Such criminal groups differ according to their degree of permanence. In some instances, they come together in order to commit one or just a few thefts, and then they break up. The stable criminal groups, however, operating on the basis of their participants' community of interests and goals, are more dangerous. Such groups are founded on an hierarchical structure; various roles are delegated, all participants act in accordance with a specially worked-out plan, and each receives a share of the bounty in proportion to the significance of the part he played. The common goal of committing theft and reliably concealing such crime ensures the unity of such a group. They therefore plan well in advance not only the means for committing the theft, but they also concoct methods of disguising same. Such groups are formed:

— either by the voluntary coming together of the various participants;

— or by actively "recruiting" into the group, via blackmail, bribes or various deals, or with similar means, those people who are in a position of authority within the department or organisation.

The position of each within the group is affected by the following: the advantage, from the point of view of the embezzlers, of the work he performs; his criminal experience; and his moral-cum-psychological qualities. The relationships between them are formed on a business-like basis and always with the aim of achieving maximum advantage. In approaching "proper" people from a large number of workers in government organs and social organisations, the misappropriators try to achieve the privileges, conditions and safety factors necessary for their criminal activities. This they do by establishing certain personal relationships; by creating a material and other dependence for the rendering of services of a primarily material character; and by giving all possible gifts, presents and bribes.

Thefts can be divided into three groups, according to the type of property stolen: (1) the theft of money; (2) the theft of valuable goods, and (3) the theft of both money and valuable goods.

The stolen property may or may not be an item recorded and accounted for in some official document. In some cases, the misappropriators steal the material valuables for future use, either by themselves or others; on other occasions, they convert these misappropriated goods into cash, jewels or securities, or they exchange them for other material goods, or for services of a non-material nature, or they simply use them as bribes.

Greed, and the desire for material gain and personal enrichment are, as a rule, the basic motives of theft.

The criminalistic description of typical means of theft is of considerable significance in the methodology of the investigation. The misappropriators' criminal activity usually falls into four stages: (1) the preparation of the crime (getting the necessary items for the theft in reserve, working out a plan for the execution of the crime, organising the gang for the crime, and so on); (2) the removal and transport of the stolen goods: (3) the use of the goods, and/or the sale of the material valuables; and (4) the concealment of the traces of the crime.

Right from the very beginning of their criminal ideas, the misappropriators generally resort to concealing their crime and the clues thereof.

The means of committing and concealing a theft depend to a large extent on the rank and position of the public servants concerned, on the type of stolen property, on the specific characteristics of the enterprise wherein the theft takes place, and on other circumstances.

The means of carrying out a theft fall into two categories:

— *the means of stealing goods accounted for*. These in turn divide into the means of theft of that property which will cause a deficit to appear on the relevant balance sheet, and the means of theft which do not cause such a deficit.

— *the means of stealing goods unaccounted for*. In these instances, a deficiency does not as a rule occur. Thefts carried out by creating unaccounted-for surpluses of valuable goods are sometimes committed in those enterprises which produce, store or trade in material goods (the building trade, industry and so on). The creation of an unaccounted-for surplus of money is a characteristic factor of theft in trade enterprises.

The specific nature of the removal, transport and use of stolen property is affected by the type and size of the goods, by the circumstances in which the crime was committed, and by the means of transport which the misappropriators may or may not have at their disposal.

The concealment of the theft is achieved first of all by fixing the books. This is often done by supplying false documentation to justify certain transactions, or by using false notes, or by adding detailed changes to documents on which this or that transaction had been correctly recorded. Sometimes, in order to conceal an illegal activity, the misappropriators do not make up certain documents when carrying out this or that particular job; instead, they destroy the relevant paperwork. On a number of occasions, they use various combinations of the different ways for concealing the theft. For example, the deficiency of a certain product can be concealed by repeatedly presenting to the commission one and the same items and objects during stocktaking, by presenting goods being used in other enterprises, or by presenting one type of items in the form of another, and so on. As far as eyewitnesses of the theft, and witnesses of certain other illegal operations and actions who would not wish to keep them secret are concerned, the misappropriators often resort to other methods—for example, blackmail and bribes — so that they will give explanations and evidence advantageous to the misappropriators. In an analogous way, they sometimes work with the auditor, with the representatives of inquest and investigation and with others engaged in the struggle against misappropriations.

The circumstances (both the conditions and the environment) of the execution of the theft affect the specific means of preparing, executing and concealing such a crime. In analysing the real complicated circumstances, the misappropriator tries to use same to maximum effect in achieving his objectives; furthermore, he endeavours to adapt to those conditions, to find the weak points therein, and to change it all for his own ends. Neglect in bookkeeping, for example, might enable and facilitate the execution and concealment of a theft. If, in an enterprise or organisation, the accounts are kept in the appropriate manner, the misappropriator will often do everything necessary to confuse them and entangle any correctly completed bookkeeping documents, so as to lower the effectiveness of auditing.

Despite the precautionary measures initiated by the misappropriators and the performance of those activities which reckon on drawing a veil over the crime, it is nevertheless inevitable that as a result of the theft, there will be traces; moreover, certain changes caused in the preparation, execution and concealment of the theft will also be evident.

In creating the reserves necessary for the theft or acquisition of material goods or straight cash, for the removal and sale of the stolen property and for the concealment of the traces of the deed, the misappropriators will have to complete a form, fill in an entry, make up an account or fill in operational, bookkeeping or other documents in which there will inevitably be found certain traces of the criminal action concerned. The criminal activities are also reflected in the physical objects involved in the business of the enterprise (in the means of production, the tools of the trade, transport and so on), and in the finished and waste products of this business. Furthermore, insofar as the misappropriators are as a rule members of the staff of the workers' collective, their criminal activity cannot be kept totally out of sight from other members of the collective. The activities of every enterprise are verified and controlled by various authorised persons representing government organs, social organisations and controlling organs of departments of state. In compiling their reports, the latter are able to identify the facts of any illegal activity committed by the misappropriators, including anything connected with an abuse of public property. Finally, any illegal acquisition of public property by the misappropriators is going to be for their use (it might even lead to their possession of valuables or participation in drinking parties), and such is bound to be noticed by members of their family, relatives, acquaintances, fellow workers and even sometimes by outsiders. Regardless of the wishes and intentions of the misappropriators, the result is always the creation of the objective prerequisites, firstly, for detecting the traces of the crime, and secondly, for analysing and using the information contained therein so as to identify the thefts and expose the thieves.

In thefts committed by public servants, the results of the crime usually fall into three categories: (1) material damage to public property, (2) other negative consequences for the economy (such as a disruption of planned deliveries, and so on), and (3) the illegal acquisition by the thief of certain goods as a consequence of the sale of the stolen property, and his further enrichment.

All these factors are important in describing the public nature of danger involved when thefts are committed, in determining the type and duration of the punishment, and in deciding other questions of criminal procedure.

The practical analysis of theft investigations suggests the presence of regular links between thefts and other crimes:

fraudulent sales, the supply of poor-quality goods, misrepresentations in supply notes, etc., criminal negligence, bribery, infringements of the laws of currency exchange, and other criminal activities. Bad management, negligence, and misuse of occupational status, all facilitate embezzlement. In a similar way, thefts and especially those perpetrated by gangs give rise to other crimes being committed in the economic and financial sectors. Misappropriators often resort, among other things, to the giving of bribes. One of the important tasks in the advance planning of the illegal activity of the misappropriators' criminal gangs is the bribery of those civil servants, upon whom their unpunished activity depends. For the purposes of bribery, the criminals sometimes establish their own special funds, from illegally acquired sources. Information relating to briberies is most frequently found in the investigations of those thefts committed by creating unaccounted-for surpluses in production and trade.

On a number of occasions, those called to criminal account as bribe-takers and who protected misappropriators include the responsible leaders in raw-material supply, transport, trade and other organisations, in administration, auditing and other organs.

The delivery of raw materials and/or equipment, which is all either unaccounted-for or illegal, to that place where the remanufacturing of goods being misappropriated takes place, is sometimes linked with the giving of bribes to public servants, who then both guarantee a safe transfer of such goods, and grant the necessary means of transport. This might also be indicated by information as to the release of railway wagons for an unplanned shipment, or the dispatch of cargo in a continuous stream.

Practical experience suggests that the misappropriators, in guaranteeing the preparation and sale of unaccounted for products, sometimes resort to remaking and re-equipping various production, storage and other plants, and to building new workshops. To this end they give bribes to the workers in construction companies, financial and other institutions, for it is these workers who decide whether or not to build and repair. It is they who determine deliveries of building materials and industrial equipment and it is they who delegate the work force to fulfil corresponding tasks as they might define.

Obviously, these circumstances considered separately do not always mean that bribes and misappropriations are taking place. They might all be explained by other reasons, by no means criminal. Accordingly, to prevent any errors in evaluating a criminal situation, reliance must be placed on a complex of linked circumstances.

The above-mentioned general descriptions of thefts are confirmed and consolidated through the criminalistic description of separate types of theft and, in particular, those thefts which are linked either with forms of shortages achieved by creating unaccounted-for surpluses in the field of production and trade, or with thefts committed in particular sections of the economy.

2. General Questions Concerning the Investigation of Thefts Committed by Public Servants.

The Organisation and Planning of an Investigation

In cases of thefts committed by public servants, the initiation of proceedings takes place:

(1) in accordance with the inventory and other documents audited by departmental and extra-departmental organs; and/or

(2) on the basis of information received as a result of an operational search.

It is therefore necessary to pay attention to the following questions:

— the composition of the participants in the audit and the level of their competence;

— the methods used by the auditors in fulfilling their duties, and whether or not these methods were effective;

— whether or not the auditors fulfilled the tasks set;

— whether all the necessary documents were presented to the auditors, and whether they examined all of them;

— whether those public servants who are responsible for the custody of materials and whose activity was investigated took part in the inventory, and whether they were acquainted with the results of the audit. Furthermore, it should be ascertained whether they agree with the results of the audit and whether their objections, requests and suggestions were verified.

Upon any missing documentation necessary for resolving the question of whether or not the deductions about the theft are correct, the proper documentation should be requested. The investigator may also inform the management about additional inspections to be undertaken in order to identify the symptoms of the thefts (an example of which is a repetition of the audit).

Sometimes, incomplete information is inadequate for the purposes of deciding whether or not to initiate immediate proceedings. For example, none of the following items is in itself sufficient basis for the initiation of criminal proceedings:

— information about someone having access to valuable goods or cash supplies and living beyond his means;

— the discovery of a forgery in the accounts;

— fraudulent sales;

— the absence of trade and trading figures in separate operations involving valuable goods; and lastly,

— excessive trade write-offs in the expenditure columns, all in the guise of various losses and/or damage.

In such instances, it is necessary to verify the amount of materials supplied, and the fundamental task in such a verification is the identification of positive indications as to the existence of a theft. The investigator receives information from those persons whose work is itself verified, from other workers in the enterprises, and also from higher, administrative and supervising organs and other persons whose evidence may be useful for shedding light on certain relevant circumstances. An important role in the verification is an examination, both of the income and expenditure accounts of the enterprise, and of those normative acts which control its everyday routine and stipulate the rights and responsibilities of the workforce. Important information can be obtained by carrying out an inventory of valuable trade goods and by auditing corresponding documents. The audit is aimed at the following:

— to verify whether all fiscal transactions in the enterprise and in its various lines are performed in accordance with the law;

— to verify whether current accounting procedures and bookkeeping documents and files are properly maintained;

— to verify the correctness of the storekeeping accounts;

— to prevent breaches in financial and economic rules, and finally,

— to identify and prevent thefts and other criminal activities.

The basic method used in the conduct of an audit is the investigation of all bookkeeping documents and of all the notes in the accounts register. However, the auditors may wish to confirm certain facts by carrying out a full or selective inventory of certain valuable materials, by resorting to an examination of the operations being verified, by undertaking test purchases, and/or by sending samples away for expert examination. Where necessary, other specialists will be called in to assist the accountants in the conduct of the audit: they include builders, technologists, experts on merchandise and so on.

It is possible to carry out test purchases and other operative-search measures in the verification, and these can be organised to catch the misappropriators red-handed.

In each particular instance, the time-scale and limits of the verification are determined by taking into account the specific nature of the events under verification.

The items/questions recorded herebelow relate to the circumstances relevant to the case and subject to the establishment of the theft by public servants in the course of an investigation:

— the type, purpose, cost, and quantitative and qualitative descriptions of the stolen property;

— whether the value of the entire stolen property was formed as the result of just one, or of several consignments stolen during the course of several operations;

— the time and place of the thefts, and the means and circumstances involved;

— the methods used in creating surpluses, in facilitating the removal of property, in transporting and effecting such thefts, and in concealing the crimes;

— the type, purpose and other parameters of equipment, apparatus and other technical and technological means and transport facilities used for the purposes of the crime;

— the particular features of those technological, financial and other operations applied in the enterprise which facilitated the misappropriators' criminal acts;

— the persons involved in the crime;

— the levels of guilt, the aims and motives in committing the crime, the socio-demographical and the moral-psychological description of the misappropriators, their criminal links and the particular role of each in the deed done;

— the quantity, type, size and cost of material and other valuables and goods received by each of the misappropriators as a result of the committed crime;

— the relevant aggravating and mitigating circumstances; and finally,

— the reasons for the crime, and the circumstances and conditions which facilitated its commission. One of the important tasks in the investigation of theft is the search for the stolen property. It is recommended that the planning of those measures by which the search is to be conducted should be based on information as to the scale of the theft, the links and life-styles of those suspected of the crime, and the places in which the property stolen is likely to be situated.

Of especial importance in this is the correct indication by the accused—who, as a consequence of the crime, have gained material benefits—of those places in which the stolen property is hidden.

The particular features of organising and planning an investigation are predetermined to a remarkable extent by the criminalistic descriptions of the thefts. In so doing, it is always necessary to proceed from a particular investigatory situation, as indeed it is when proposing theories of the crime, or in determining the line of investigation to be taken and the entire range of investigatory activities and operative-search measures to be initiated: the purpose of it all, of course, is directed at resolving the question of which tactics are to be employed.

Just as in the investigations into other crimes, the theories of how the thefts were committed are concerned with various unknown circumstances the establishment of which is an important factor in identifying both the crime and the criminal. In some instances, these theories might be connected with the question of who committed the crime; in others, they are concerned with the time of and the place where the crime was committed, and the means by which this was done, or they might deal with the scale of the theft, the site where the stolen goods and the illegally acquired resources were hidden, and so on. Theories must be comprehensively and objectively verified if they are based on the information of suspects or the accused, information which contends certain facts of and deductions about the crime. The proposal and verification of a theory of the crime, and the decision as to which tasks should be performed during the investigation, demand a comprehensive, well thought-out, detailed and creative planning, and a strict organisation of the investigator's work.

The organisational measures include the following:

— the organisation of an inventory, and/or the removal of those valuable items which remain;

— the conduct of an audit, test purchases and various other verification procedures;

— the initiation of measures for the guaranteed protection of necessary documents, objects and property;

— the appointment of a selected number of competent and conscientious workers to carry out the relevant verification, and the necessary control over their work;

— the appointment of a selected number of specialists — technologists, accountants, commodity experts, etc.— to take part in the investigatory activities;

— the identification of witnesses;

— the creation where necessary of investigatory teams to carry out an investigation of the case in question, to study the enterprise's books, to look into its pass-control system, to examine the work of special structural units of the enterprise, and to scrutinise the normative acts governing their work;

— consultations with experts, firstly, about the order of entries in the accounts, and secondly, about technical, technological and other questions, for the resolution of which specialist knowledge is required.

Along with the plan of the investigation, it is also recommended to use personal cards on each of the misappropriators, and on these cards the identifications of relevant proofs and other information which might be useful in the case in question are written. Furthermore, it may be useful to draw up diagrams of the criminals' connections, of the various episodes of criminal activity involved, of the connections among the various enterprises, of their subdivisions, of the technological and other processes of production and of document exchange, and of the various inspecting and controlling systems deployed, and of anything else which might help the investigator disclose the facts of the theft.

In an investigation into a theft by public servants consisting of many episodes, the team method is usually employed. It is important to create such an investigatory team in due time, and it usually includes those investigators who specialise in the investigations of thefts carried out by gangs.

The effectiveness of the work of the investigatory team depends on the following:

— the setting up both of a general plan of investigation, and of individual plans for each investigator;

— a mutual exchange of information received;

— joint discussions of the work plans and of other questions of the investigation; and

— the participation of the leader of the team in the most serious business of the case.

At the first stage of the investigation into a case of theft, different investigatory activities are planned and carried out, and the nature and sequence thereof are determined principally by the specific features of the committed theft (the scale thereof, how long ago it was committed, the number of participants in the crime, and so on), and by the specific features of the already somewhat complex investigatory situation. The following are the most distinctive characteristics of the investigation:

— the examination of the scene of the crime;

— the seizure of various specimens of the products, raw materials, semi-manufactured products and means of production as well as the withdrawal of various items and objects especially relevant to the case;

— an inspection of the documentation;

— the seizure and transfer to safekeeping of documents and material valuables, if there are lots of them, and if they are rather large;

— the conduct of a search of the places of work and of the homes of the initial suspects;

— the examination of other places, if certain information suggests stolen property may there be found;

— making inventory of the goods of the misappropriators;

— the seizure of bank deposits and personal correspondence; and finally,

— the arrest of the misappropriators red-handed and searching them.

Also included in the initial investigatory activities of the given team are:

— the planned interrogations of witnesses and of those who participated in the audits, inventories and/or other verification processes;

— the interrogations of the suspects;

— inventories and audits; and furthermore,

— criminalistic, trading and other expert examinations of various objects.

The preparation of an interrogation into thefts presupposes:

— the study of the special features of production and of the financial transactions in the enterprise, of the description of the official powers of the person under interrogation, and of the nature of information about his personality;

— the readiness to hand of a selection of necessary documents, other materials of the case and samples (or photographs) of products;

— the determination of a set of questions and their sequence, and the planning of other investigatory activities and operative-search measures which may be carried out immediately after the interrogation.

At the beginning of an investigation, it is necessary for the witness to explain just what sort of official and/or personal relationships he may have with the suspects (or the accused). The witness is also interrogated as to the facts of the theft known to him, and of those circumstances thereof which may shed some light upon those facts, separate activities of the misappropriators, their behaviour, and so on.

If a case is instituted on the basis of auditors' reports or inventories, there may arise the necessity of an immediate interrogation of the persons responsible for the materials concerned, or indeed of their colleagues, auditors, or accountants. Then the removal and inspection of materials must be conducted in the enterprise. An interrogation of the suspects and their colleagues, relatives and acquaintances will be planned for later, as will be the seizure of the property of such suspects (or accused).

The necessity of conducting a forensic examination of accounts arises on the following occasions:

— when there is a contradiction between the results of the audit and information received from other sources, and also when there is a contradiction between the conclusions of the initial audit and those of a subsequent one;

— when there are grounds for questioning the correctness of the methods of audit chosen by the auditor;

— when there exists a basis for supposing that the auditor was neither conscientious nor objective;

— if persons concerned argumentatively refute the conclusions of the auditor; or

— if other issues, which fall within the competence of the auditor, are resolved incorrectly, incompletely or even are not decided.

A judicial audit undertaken by a commission of experts helps:

— to answer those questions relating to the correctness of the auditor's conclusions;

— to check the way in which determined are the scale of shortages and surpluses and the occasions when they occur, and other items concerning the persons responsible for same;

— to verify the correctness of accounting records and accounting procedures affecting the transfer of goods;

— to verify the grounds for writing off material valuables of trade;

— to compare the official information on accounting practices of the person concerned with other information collected from notes, memoranda and other sources; and finally,

— to determine the deficiencies in the accounting methods, and the nature of the infringements committed by the clerks concerned. An expert-accountant may help the investigator to conduct complicated calculations based on the conclusions of other specialists, the testimony of other witnesses and other materials as to the quantity and cost of the unaccounted-for products, as to the excessive sums received from customers, and as to the sums underpaid to the suppliers of agricultural products, and so on.

It is necessary to put at the disposal of the expert, not only the accounts, but also the evidence of the public servants concerned, as well as the documents and materials which are concerned with the circumstances being investigated.

3. The Particular Features of an Investigation into Several Groups of Thefts Committed by Public Servants

The Investigation of Thefts Committed via the Creation of Unaccounted-for Surpluses in Production and Trade. For the detection of thefts committed by the creation of unaccounted-for surpluses in production, the answers to the following questions are decisive:

— in which form, in what volume, where, by whom, when, by which methods, with the help of which means, and from which primary materials were such valuable trade surpluses made or transformed?

— how and with the participation of whom were the products removed and transported?

— where, by whom and by what means were such goods sold?

— by what means were all these criminal activities concealed?

— what was the value of the stolen goods, what was the "take" of each member of this gang of thieves, who were its members, and what was the role of each in the execution of the crime?

In those instances, when the unaccounted-for production is sold in trade enterprises (and this also relates to the delivery of ill-gotten goods and to the conditions of sale of the unaccounted-for surpluses created in these enterprises) it is also necessary both to answer the questions as to the nature and sources of the unaccounted-for surpluses, and to establish by what means the money was taken from the proceeds, and how this was concealed.

Also important is the following:

— the disclosure of and the investigation into unaccounted-for surpluses of raw materials, semi-manufactured goods and finished products, and also of by-products;

— the examination of the tools and resources used in the manufacturing processes, sales and other operations of such items;

— the identification and inspection, firstly, of those documents wherein are recorded either the transfers of unaccounted-for trade surpluses or the sequence of illegal transactions, operations and actions associated therewith; and secondly, of those darft notes which relate to such criminal transactions and accounting procedures; and lastly,

— the definition of the quality of those accounted-for products of a similar description which were worked and manufactured at the time of the crime.

To identify and verify a theory of how the reserve supplies of the stolen property were first created, the typical and most often used means of such a criminal operation must be known. These are as follows:

— the issuance of fictitious commercial documents concerning insufficiencies and losses in transit committed in the enterprise (in the base, store, shop, etc.);

— the write-off of a part of the goods received (according to the losses-in-excess rules and which supposedly arose as a result of unforeseen circumstances), even though in actual fact such losses never occurred;

— the receipt and acceptance of materials (goods or cash) without the corresponding documents to confirm the receipt and acceptance of same, and without such entries as would normally be required;

— the destruction of those documents which would otherwise confirm the receipt and acceptance of such goods; and finally,

— the reduction of the quantitative and qualitative indices of the relevant trade valuables.

Unaccounted-for surpluses are also created in the processes of storing, dispatching and re-processing such trade products. This is done via deficiencies in supply, by writing off good-quality products as if they had been damaged, by in-excess "losses" of goods or, in cases of thefts of cattle and poultry, by writing off some of the animals as if they had been killed in transit.

Meanwhile, the unaccounted-for surpluses in storage are created by an infringement of the rules for keeping raw materials, semi-manufactured goods and/or manufactured products, and in particular by increasing the weight or size of the relevant articles by wetting them, by raising temperature in depots and so on.

There are also some other ways of creating artificial reserves: by increasing the amount or cost of completed works on the corresponding accounts; by a duplicated payment for one and the same job; by economising on the use of raw materials via the application of more rational ways and means and then by writing off such economies in accordance with obviously inflated or outdated standards; and lastly, by the artificial reduction of the markings on the cash-desk scales, etc.

In investigating the circumstances of the removal and disposal of the stolen property, it should be borne in mind that although the misappropriators may endeavour to realise their operations unnoticed, that nevertheless cannot be achieved without leaving some traces behind. Thus, any of the following may indicate to the removal of such stolen property:

— the transfer of unaccounted-for articles, either without the corresponding documents, or in a different quantity to that stipulated;

— presenting expenses as if it was an acquisition of goods purchased, even though such a purchase did not take place;

— the artificial increase of the totals on the pay-sheet;

— the display of forged signatures or of those of fictitious persons on the pay-sheet; and finally,

— additional sums and payments to persons who have not done any work at all at the enterprise concerned.

Generally speaking, unaccounted-for products materialise either in the sale thereof at the manufacturing enterprise by the misappropriators; or in the transfer for resale to speculators; or in the dispatch of same to trade organisations for re-manufacture or for manufacture into new products in other enterprises in which other misappropriations are to be committed, while all the accounting is done as if such products were received from state procurement agencies. Meanwhile, those in charge of state procurements fix the documents relating to the acquisition of such products supposedly as direct cash procurements from the small local units. So-called procurement money that allegedly has to be accounted for is then distributed among the misappropriators.

To conceal the transfer of unaccounted-for goods in trade enterprises, the following methods are employed: the unaccounted-for products are transferred with the accounted-for ones, and all are recorded on one invoice. Then a new invoice is issued whereon the unaccounted-for products are not mentioned, even though they were received in the trade enterprise. Sometimes the products are transferred according to an invoice written out on a false form (and after the goods have been delivered and accepted, the invoice is destroyed). Sometimes goods are delivered by repeatedly using one and the same invoice, or in accordance with the invoice which is then returned and cancelled as if the deed concerned had not been carried out. In some cases, all copies of the invoice, are forged (after the products have been delivered) so that the quantity of goods recorded is lower.

A knowledge of the enumerated methods used by the misappropriators helps the investigator to determine which line of investigation to pursue, to construct more reliable theories of the crime as befits the now more complex situation, and to undertake investigatory activities and operative-search measures.

In disclosing a theft carried out by means of creating unaccounted-for surpluses, the following may be useful:

— a verification both by quantity and quality, that the material written off in the expenditure of raw materials corresponds to the actual expenditures involved in the manufacture of a particular product in a particular period of time;

— a verification that the quantity of goods written off as spoilage or waste, as natural wastage or loss or in transfer to a lower sort, is correct;

— a confirmation that the basic reports on insufficiencies and losses are correct, as too should be the rules and standards for applied expenditures;

— a comparison of the books of the enterprise with the documents of the regulating agencies (enterprises of supply and demand);

— an identification of the expenditures in excess of the planned expenditures of electricity and wages, etc., borne by the enterprise in connection with the procurement, receipt, storage and sale of unaccounted-for materials;

— a comparison of the information about the quantity of accounted-for finished articles with details given about the quantity of operations carried out in the production processes;

— a verification of whether certain persons, who are not on the staff of the enterprise, worked there; and

— an investigation into the possibility of manufacturing unaccounted-for products besides the accounted ones.

Work in the manner indicated suggests the initiation of examinations, searches, inventories and audits, all to be carried out in the various departments of the enterprise. Furthermore, searches of the town flats and country cottages of the misappropriators should be carried out, as too should searches of their official and private motor cars and garages. In addition, the initiation of a judicial audit, the setting up of technological and other commissions of experts, and interrogations of the workforce at the enterprise, etc., should also be considered.

Similarly, in order to explain the circumstances of a removal of unaccounted-for building materials from a construction site, it is necessary to examine the stores and to interrogate the storekeepers, accountants, lorry drivers and chauffeurs, as well as those persons who signed for the transfer of the goods in question. It will also be necessary to verify the documents associated with the sale and transfer of these materials, and to examine the official pass register.

Unaccounted-for surpluses of goods or cash in trade enterprises may also be discovered, firstly, by checking the invoice documentation and transfer notes for all trade, packages and cash transactions in the given enterprise, with those of the suppliers and the consumers; secondly, by verifying the correct use of the warrants, and by interrogating witnesses from among the workers — and from among those already retired — at the given trade and supply enterprises, or from among the customers and purchasers; thirdly, an examination of the receipts, issue notes and packaging notes; fourthly, a search of the various departments of the enterprise; and lastly, the initiation and conduct of commodity, technical and other expert examinations.

The objects to be examined, and on a number of occasions to be searched, are as follows:

— tools and instruments for the production, storage and disposal of products (technical equipment and refrigerators, machinery and apparatus, packaging materials, stencils, weights and so on), and measuring instruments;

— products (finished articles, semi-manufactured goods, and so on);

— waste products and written-off materials;

— technical, technological and other documents and accounts, as well as unused forms of various documents;

— unofficial documents, correspondence and draft notes;

— labels, price-tags, trade marks, ready cash and other valuables.

A search of the homes of the accused, the suspects and their accomplices is carried out for the purposes of finding stolen property, goods and materials taken illegally, valuables for further confiscation, invoices, notes, draft memoranda and other pieces of information relevant to the case. Attention must be given to any notebooks in which may be found notes about completed deals, names, nicknames, addresses, telephone numbers of the accomplices, photographs (and some of these may be of the accomplices, knowledge of whom the accused denies), specimen stamps and seals, unused forms, coded notes, etc.

The accounts are also submitted to examination — they include all separate invoices, accounts rendered, bills, statements of account, cash documents and others — as too are the register of the inventory, the contents thereof, and any other documents or blank forms, letters and so forth.

An important part of the examination is the detection of erasures, corrections and additions which might indicate forgeries. Specialists may be asked to participate in the examination (accountants, technicians, economists, etc.).

A vital part of any inspection is the audit.

Having received the deeds of the audit, the investigator must first of all check whether the tasks he proposed for the audit were carried out in full, and then, he must analyse the results obtained by the auditor. If any of the explanations in the report of audit are unclear, if the arguments presented are insufficiently persuasive, or if the auditor's conclusions are somewhat at odds with the information of the investigator, then the latter should question the former. Where necessary, the investigator has the right to consider the conduct of a supplementary or repeated audit by other inspectors. If, having acquainted himself with the findings of the auditor's report, the resulting questions are not resolved in this way, he will order for a conduct of a forensic examination of the accounts.

In the instances of theft executed via the creation of unaccounted-for surpluses, a technological examination is ordered for such issues as whether or not in the production of goods and semi-manufactured articles, the correct procedures were carried out; how raw materials were used, and how some were written off; and in the creation of unaccounted-for surpluses and reserve stocks, which technological equipment and technical resources were deployed.

The technological expert may be asked whether the standards for the use of raw materials and auxiliary materials were substantiated; whether the laid-down procedures for filling in such documentation and for carrying out laboratory tests of quality of the relevant products or raw materials were correct.

The following question is significant: is it possible for the enterprise or workshop of such a size to produce, besides the accounted-for products, a defined quantity of unaccounted-for items? The technological expert plays its part in answering this question. In such cases of theft and misappropriation, other expert examinations are also carried out; they include commodity, construction-cum-technological, economic, agrotechnical, veterinary and other examinations.

The commodity examination resolves those questions which pertain to the quality, type and place of production of both accounted and unaccounted-for articles and goods, as well as other matters concerning their transportation and storage.

Meanwhile, the construction-cum-technological commission will examine such matters as to whether or not the qualitative and quantitative descriptions in the deeds of acceptance of construction works recently completed were correct; as to whether the standards and costs of the work undertaken were increased; whether material written off should have been so dealt with, and so on.

Specific Features of an Examination of Misappropriations. The deficiencies of material goods and financial resources can be caused by various factors. Usually, they occur as a result of misappropriations carried out by public servants and/or other persons responsible for same, as well as abuses of their status and criminal negligence. Such deficiencies might occur as a consequence, either of misappropriations committed by other workers of the enterprise in question, or of theft.

In the course of the investigation, the reasons for such deficiencies must be verified. It is accordingly necessary firstly, to explain the size of the deficiency and the type of goods involved; and secondly, to establish:

— when it occurred;

— on whose accounts such goods were recorded;

— whether the deficiency could have been detected earlier and, if so, why it was not, and by whom and with what means it was concealed;

— who had access to the goods in question, and in which conditions they were stored.

In those circumstances when the investigator's theory of misappropriation is confirmed, he should turn his attention to answering the following questions:

— when, by whom, and in what circumstances the misappropriations were committed, and which goods were involved;

— how they were removed;

— with the help of whom, in which circumstances and through which channels of sale the goods were disposed of; where the latter were located, and where they were found.

In explaining how the transfers of items took place, it is first of all necessary to establish via which means the removal of the stolen goods was executed.

For the categories of crime under consideration, the following actions are often carried out:

— an examination of the production and trade centres, and of all relevant documentation;

— inspections, audits and other forensic examinations;

— interrogations of suspects and of those witnesses somehow connected to the goods and/or the inventory thereof;

— searches; and lastly,

— legal confrontations among the accomplices.

Specific Features of Investigations into those Misappropriations Carried Out via Forgeries of the Accounts. Embezzlers usually resort to the fabrication and use of false documents, when the distribution of blank forms at the enterprise is placed under strict control, and when it is difficult to cancel same. In particular, they may use forgeries in those invoices which relate to the transport and delivery of valuables. And forged documentation may also be used in relation to unaccounted-for production, the concealment of deficiencies, the sale of misappropriated property, and in certain other instances.

In the disclosure of such crimes, it is necessary first to explain:

— in which accounts the forgeries were committed, by whom, when, by what means and in which circumstances;

— by whom, when, where, and to what purposes such forged documents were used;

— which goods, and in what measure, were misappropriated in this way, and what was their value.

Most frequent procedures are as follows:

— an examination and a technical-cum-criminalistic investigation into the documents concerned;

— an analysis and verification of the information contained therein;

— an interrogation of those persons involved in making up the accounts;

— the acquisition of handwriting samples, firstly, of those persons suspected of forgery, and secondly, of those in whose names the documents were written up and/or whose signatures are thereon to be found and the graphic examination thereof; and finally,

— an expert examination of the nature of the documentation, i. e., it should verify the originality thereof, and expose any signatures, seals, stamps, erasures, corrections and other alterations as may be in the text.

Misappropriations may be revealed in the accounts in the form of a contradiction between the contents of one and the same document; in the contents of several interrelated documents (and/or various copies of the same document); or between the contents of one account and the actual reality to which it in theory corresponds.

The methods of inspecting the accounts are as follows:

— a verification of the documentation in form (i. e., are all the necessary papers included, and are there any among them of doubtful origin?);

— an arithmetical verification (are all totals correct, and do both the horizontal and vertical totals tally?);

— comparisons of the various copies of one and the same form, of the different parts thereof, of the original forms with the audited results, and of the various documents by their content, concerning the transfer of this or that property;

— a correlation of relevant documentation (i. e., a checking of the notes held by one organisation, by comparing them with the documents written up as a consequence of mutual transactions with other organisations);

— a comparison of official documents with the corresponding draft notes;

— a verification of the information contained in certain documents, either with the reality (by measure and description) of the operation concerned, and/or with the actual existence of raw materials and primary products by quantity, weight and quality, etc.;

— a checking of whether or not the operations described in the documentation were actually carried out;

— a comparison of information contained in the documentation with the results of the interrogations about it of those persons mentioned in those documents; and lastly,

— a comparison of documentary information with other information recorded by technical means.

In establishing the fact that a certain document is a forgery, it is sometimes necessary, when identifying those documents which have been written up with the assistance of particular tools and means to disclose and inspect those tools and resources; it may also be necessary to verify the presence of documentary information which relates to the transfer of misappropriated goods in the supply and consumer enterprises, and also to identify and interrogate witnesses as to the quantity, cost, weight and other indications of the stolen property in question.

CHAPTER XXVI

INVESTIGATION OF MURDER

1. Criminalistic Characteristics of Murder

Murder is the act of unlawfully killing one human being by another.

Typically, criminal proceedings for murder are instituted in the following cases:

— of discovering a dead body with signs of violent death;

— of discovering parts of a dismembered body;

— of a person disappearing under circumstances suggesting a possible murder.

To give a criminalistic description of the crime and select methods of inquiry, it is essential to know whether it was an "open" or a "secret" murder.

An "open" murder is committed either in the presence of other persons by a person known to them, or in their absence but without any attempt on the part of the murderer to conceal the fact or his guilt. Qualified as "open" murders are also cases when the offender is apprehended on the scene of the crime as a result of hot pursuit, or when he voluntarily gives himself up.

A "secret" murder is committed in the absence of other persons, the offender is doing everything possible to conceal his involvement in the perpetrated deed. A "secret" murder is also one that is committed with other persons being present but not being able to see the offender well enough and the offender being able to escape.

In the first case, the investigator concentrates on verifying the testimony of the accused and witnesses and its correspondence to reality, on finding out the motives and other circumstances of the crime. In the second case, the main objective of the inquiry is to trace the criminal.

An important part of a criminalistic definition of murder is information concerning the manner of committing and concealing a crime.

The mode of perpetration may be surmised from the number of participants, the physical strength of the offender and the victim, and the offender's having or not having a weapon (tool) to commit a crime.

The mode of concealing a crime depends on the scene of murder (the offender's or the victim's domicile, neutral territory), the offender's distinctive characteristics (physical strength, certain occupational skills, age, sex and other data), the presence or absence of witnesses.

One of the factors determining the offender's choice of mode of committing and especially concealing a murder is the existence (or absence) of personal relationship between him and the victim. A murderer unknown to the victim (if the crime is not committed in the home of the latter) normally tries to conceal only his involvement in the murder and does not take any steps to conceal the fact itself. To conceal his involvement, he tries to destroy all traces on his clothes, body and on the scene of the crime, after which he tries to escape. Occasionally, an offender employs surface camouflage to prolong the search for the body (dragging the body off the road, using branches, grass or snow to hide the body, etc.).

If there has been some relationship between the offender and the victim, and the latter's death may cast suspicion of murder upon the offender, he will often select a mode of killing that would make it appear to be death from other causes (like drowning, poisoning, suffocation, hanging, falling from a height and the like). If an offender believes that there are sufficient grounds to suspect him of murder, he takes steps to conceal the crime by destroying or hiding the body or trying to prevent the identification of the victim. Sometimes he only tries to conceal the real cause of death — he "stages" a murder by other people, homicide by misadventure or in self-defence, etc.

Concealment of traces of a crime is, as a rule, concomitant with consciously incorrect explanations of the incident, with inducement and coercion of witnesses into misprision or perjury.

Murder is mostly committed with stabbing and cutting weapons or household tools, chance objects that happen to be at hand (like a stick, stone or bottle), firearms, or poison. A premeditated murder is sometimes committed with a specially prepared "non-standard" weapon or means. Its choice is primarily determined by the motives of the crime, the time when the criminal intent originated, and the scene of murder.

The scene of murder is in most cases that of an offender's or his victim's domicile (a flat, store-room, outbuildings or the like). Its establishment makes it possible to find traces elucidating the ways and means in which the crime was committed and the offender's identity. The traces are to be found on the dead body, on its clothing and on the details of the scene. They include: (a) marks of the offender's hands, feet or other parts of the body, parts of his clothing, criminal weapons and other articles; (b) hair, particles of skin, blood, saliva, other secretions, details of the offender's clothes, and miscellaneous objects; (c) traces of his actions (inflicted injuries, damage to the victim's clothes, changes in the scene); (d) signs of struggle.

An indispensable element of a criminalistic description of murder is information about the time of its commission. The time is established within the limits of twenty-four hours or less, and sometimes within minutes. The establishment of the exact time may be required when an accused pleads an alibi and in some other cases.

An essential element of a criminalistic description of wilful murder is data showing the motives of the perpetrated crime. Rather often murders are committed from mercenary motives and hooliganism. Jealousy, revenge, the desire to get rid of a relative who has become an encumbrance, and other similar motives are characteristic of an offender personally related to the victim. Motives of murder are sometimes connected with a victim's official and social activity which affected the offender's interests. Wilful murders are also committed to conceal another crime or to remove obstacles to its perpetration.

Wilful murder may be committed with malice aforethought or instantaneous. This manifests itself in different circumstances of the commission and concealment of crime (criminal tools used, degree of gravity and distribution of bodily injuries, time and scene of crime, etc.).

2. Investigatory Theories and Investigation Planning

When a dead body is discovered, the nature, distribution and number of injuries, the location of the body and other circumstances may undoubtedly point to a violent death caused by another person.

Signs of crime are not always so pronounced, and the established facts may serve as a basis for constructing several theories of the cause of death: murder, suicide or accident. Such may be the case when a dead body is recovered from a pond, lake or river, found hanging in a noose or killed by the action of excessive temperature, an electric shock, or a fall from a height. It may also sometimes apply to cases of sudden death (from natural causes or illness), death caused by a firearm shot and other reasons.

When a person disappears, it is not only the cause of death, but the very fact of death that may be hypothetical. Absence of information about a missing person is often explained by reasons other than murder. Instituting criminal proceedings on account of a person's disappearance should, therefore, be preceded by the verification of the circumstances of disappearance and of his possible whereabouts.

The verification is carried out by means of: (a) obtaining explanations from the declarant or the missing person's family, neighbours and acquaintances; (b) making inquiries in hospitals, morgues, investigation wards and in organisations and institutions which the missing person was connected with; (c) examining the missing person's documents and correspondence. If the verification yields information indicating signs of murder, prosecution is started at once.

In secret murder, considerable difficulty arises with advancing theories concerning the identity of the offender. Their construction may rest on data about the time, scene and mode of the commission of murder, its concealment, criminal weapons and means, traces found on the scene of the crime, etc. Thus, a theory about an offender having had personal relations with his victim may proceed from such information as the offender's intention to conceal the fact of death (disposal or hiding of the body, faking the missing person's departure for another place) or faking an accident or suicide. A theory about a specific perpetrator of murder may be based on data indicating his contacts with the victim immediately before death, his personal interest in getting the victim out of the way, etc.

An inquiry plan should in the first place envisage such investigatory actions and search operations that will yield most reliable information concerning the perpetrated crime and the offender, and help to apprehend the murderer. They will be: examination of the scene of the crime and of the body, and search operations aimed at detecting, pursuing and apprehending the criminal.

When investigating murders, the first measures to be planned are those of finding and questioning witnesses. Thus, the plan should include getting the names of persons who happened to be in the neighbourhood (passing by the scene) during the crime, immediately before or after the murder. They may be people living or working in the locality. After the investigation of the scene of the crime is completed, a forensic-medical expert examination should at once be appointed. An expert examination must be performed to ascertain the cause of death and the nature of bodily injuries. There may be some other investigatory actions planned, if necessary, like a search, an investigatory experiment, etc.

The sequence of investigatory activities and search operations depends on the set of circumstances established in the first stage of the investigation.

3. Initial Investigatory Activities in Case of Discovering a Body with Signs of Violent Death

When a dead body showing signs of violent death is discovered the following investigatory activities and search operations are to be taken without delay: (a) inspection of the scene of crime; (b) hot pursuit of the offender; (c) measures aimed at identifying the victim; (d) forensic-medical, criminalistic and other forensic expert examinations; (e) finding and questioning witnesses; (f) search of the suspect's home.

Inspection of the scene of the crime should immediately follow reports of discovering a body with signs of violent death on it. External examination of the body on the scene of discovery is to be carried out with the participation of a forensic pathologist or, if he is not available, some other physician.

Upon arrival at the scene, the investigator should take all possible measures to organise the hot pursuit of the offender and also a search for stolen property and objects dropped or forgotten by the offender.

In the process of investigation, the objective of the investigator is to obtain all the information bearing on the event and its participants. To ensure an exhaustive examination of the scene and body, some recommendations on points to be clarified during the investigation may be suggested:

1. What has taken place (murder, suicide or accident)?
2. Identity of victim.
3. Scene of murder (scene of discovery or elsewhere).
4. Time of death.
5. Perpetrator of murder (number of perpetrators, their physical and other characteristics, habits and skills).
6. Modes of committing and concealing murder, criminal weapons and means.
7. Offender's *modus operandi* prior to committing murder and after it. Knowledge of the victim's life-style.
8. Possible motives and objectives of murder.
9. Consequences of crime.
10. Circumstances conducive to murder.
11. Possible sources of obtaining additional information about circumstances and perpetrators (persons who may have seen or heard).

After a preliminary search of the scene, a point-by-point examination is to be carried out: the body and its surroundings, places bearing marks of the offenders' entry and also pointing to the way they made their exit; traces and objects left by the offenders; marks left by the victim; traces of a possible struggle between the offender and his victim; traces of the criminal's weapons and the weapons themselves.

The examination of a dead body is to be performed in a certain sequence. First to be examined is the scene, the surface on which it lies ("bed of the body"); also to be noted are its physical attitude, its relative position with respect to other details of the scene, the presence of any objects or particles on the body, its hands and forearms.

A detailed inspection of a dead body is to begin with its clothes. A thorough examination is to be made of their state, the presence or absence of damage to them, of any superimpositions and marks on them (smears, stains and the like). To be also inspected are the contents of the pockets, the presence or absence of any objects under the cuffs and lapels. Then the investigator is to proceed to the examination of the body itself with a view to identifying injuries and signs of death. The examination of each injury on the body should elucidate the following points that are to be noted in the report: (a) nature of injury (fracture, wound, scratch or bruise); (b) its exact location and distance from other parts of the body; (c) size of injury lengthwise and across, diameter of round injuries; (d) shape of injury and its edges; (e) state of integument around injury (if smeared by anything).

The nature of a wound is determined by a forensic-medical expert.

The inspection of the scene may reveal signs unmistakably indicative of murder. They may be:

— injuries whose character rules out the possibility of their being self-inflicted;

— signs of struggle, and also traces of self-defence;

— absence of a death-inflicting weapon on the scene of the incident or its presence in a place that excludes its conscious or negligent use by the victim;

— traces pointing to a displacement of the body;

— lack of agreement between the location of livid stains and the position of the body.

When discovering a scene, typical of suicide or accident, it is important to note such details as may be indicative of a fake for the purpose of concealing the fact of murder. If a dead body is found hanging in a noose, the following circumstances suggesting a fake may be revealed: (a) absence of a supporting (propping) object when the distance between the noose and the floor (ground) is larger than the victim's height; (b) discrepancy between a dirty rope or dirty object to which it is secured and the body's clean hands, as well as between a dirty floor (ground) and the body's clean feet (shoes); (c) presence of a horizontally closed strangling groove besides an upward slanting groove; (d) lack of agreement between the mark in the strangling groove and the material of the cord; (e) presence of indentations from hoisting up the body at the suspension point and an upward disposition of wood fibres; (f) inconsistency of the direction of streaks of blood or other secretions on the body with its position (horizontal streaks on the face of a vertically hanging corpse).

The "staging" of an accident or suicide with the help of a firearm may be exposed by the following signs: (a) absence of traces of a close-fired shot on the body; (b) lack of agreement between the discovered weapon and the nature of the bulletwound; (c) presence of a firearm on the scene from which the victim could not have possibly inflicted a wound on himself; (d) location of a bullet wound (bullet wounds) excluding the possibility of its having been self-inflicted.

The faking of a fatal fall from a height may in some cases be exposed by injuries on the body that could not have resulted from a high fall, and also by a distance between the body and the high object that makes a body's free fall or a person's jump impossible.

The presence of wounds on a body inflicted with a cutting or stabbing weapon or some other similar instrument calls for exploring the possibility of their being self-inflicted and for checking whether the injuries on the body and the corresponding parts of the clothes coincide and what is the correlation between the dimensions of the weapon, the damage to the clothes and the wounds on the body.

The identity of a victim is usually established during examination through identification by those present on the scene and with the help of documents found on the body. The contents of a victim's pockets, his clothes and other belongings are also to be examined for traces to his identity. Articles of clothing, underwear, shoes, and hats sometimes have trade marks or personal inscriptions; examination of a victim's pockets may produce address-books, envelopes, notes, receipts, tickets and other items facilitating his identification. A victim's clothes and body sometimes reveal occupational and other identification marks (like calluses and ink stains on the right middle finger of people who write a lot).

If the investigation on the scene of a crime does not result in the victim's identification, to facilitate it later, the report sheet must give a detailed description of the victim's distinctive features by the verbal portrait method, the body must be fingerprinted and an identification photograph taken, prior to which the body must be "laid out". The contents are extracted from under its finger-nails, since microparticles may indicate the victim's occupation. Samples of hair are cut off the body's head and attached to the report. Articles of clothing and other things found on the body are also registered.

"An unidentified body" case card is to be made up for an unidentified person.

The scene of murder can be inferred from the details at the scene of the incident, the location of livid stains and other circumstances. Indications of a body's displacement after murder may be suggested by: absence of blood on the scene of discovery contrary to the nature of injuries presupposing profuse bleeding; traces of the dragging of a body; negative location of livid stains (the body is lying on its stomach, whereas the livid stains are on the back, or vice versa), and other circumstances.

The time of the occurrence of death is primarily estimated by pathological signs (cooling, rigor mortis, livid stains, signs of putrefaction). Also helpful are such indirect data as wet or dry traces, warm or cold objects, fresh or dried (or decayed) food left-overs, the latest issue of a newspaper, switched-on lights, etc.

The number of offenders may be concluded from the character of the injuries; the presence of different foot- and palm prints; cigarette butts, different ways of squeezing them and putting them out; the number of dishes used for eating and drinking; a simultaneous killing of several persons; the disappearance of cumbersome or heavy objects, etc.

The identity of an offender may be conjectured from the traces left by him on the scene. For example, foot marks suggest a person's sex, height, gait pattern (lameness, foot dragging), tempo of walking or running, size and style of shoes. Hand marks are not only used for subsequent identification but sometimes they also provide information about the size of the hands, some deviation from the norm, etc. Tooth marks (bite marks) often reflect an offender's dental structure. Articles of clothing, shoes, or hats left behind or accidentally dropped by an offender sometimes help to determine his height and build. An offender's hair, blood, saliva and semen are also often found on the scene. A murderer's physical strength may be estimated from the nature of the injuries and destruction wrought by him and also from the wounds that he inflicted on the victim. An offender's habits and skills are evident from his characteristic ways of forcing locks, tying knots, committing murder and from tools and weapons used by him for this purpose.

A search of the scene of an incident may reveal data indicating the commission of murder by either a person unknown to the victim or by an acquaintance. The commission of murder by an outsider is characterised by traces of forced entry into the premises, the offender's lack of knowledge concerning his victim's circumstances and daily routine, as well as the arrangement of household objects and the location of valuables. But the possibility of a victim's relatives or acquaintances perpetrating the murder and subsequently faking robbery should not be excluded either. A fake will manifest itself in negative indicators, like the forcing of locks from the inside, unjustifiable disorder, pointless destruction, absence of traces of outsiders on the scene of the crime, surface injuries on the bodies of the victim's relatives allegedly inflicted by malefactors whom no one but the family seems to have seen, etc.

The mode of the commission of murder and the weapons and means employed are suggested by injuries on the body, damage to the clothes and details of the scene, as well as by criminal weapons found on the scene.

The state of the locks on the doors and windows, evidence of destruction, objects left behind or lost by the offenders, and also foot traces and vehicle tracks near the scene determine the offenders' *modus operandi* before and after the commission of the crime.

An inspection of the crime scene and body may sometimes reveal traces disclosing possible motives and objectives of murder. For example, disappearance of valuables and other property, traces of the premises being combed through and depositories broken into are typical of murder from motives of robbery. Discovery of a body in a street or park with signs of the victim's alcoholic intoxication before death and with articles of his clothing, money, watch and other belongings intact, is generally evidence of homicide in a fight, from motives of hooliganism. A characteristic position of a female victim and the state of her clothes and underwear usually point to murder with rape, etc.

Identification of an Unidentified Body. If the identity of a victim is not established during the examination of the scene of crime, it is advisable to enlist the cooperation of persons knowing the local inhabitants (e. g., postmen) for his identification. To identify unidentified bodies, use is also made of criminal registration (see Chapter XIII).

The taking of all appropriate measures may yield information supposedly indicating the identity of the victim. In such cases, the missing person's relatives and acquaintances are shown the body or (if the body has been buried) its photographs, clothes and other things for identification. Use may also be made of forensic expert examinations (forensic-medical, criminalistic, commodity-research ones, etc.).

Interrogation of Witnesses. An investigator may, upon completing his examination of the crime scene and body, directly proceed to the interrogation of witnesses. At this stage of inquiry, to be questioned as witnesses are persons who were first to discover the body, witnesses to the crime, the victim's relatives, neighbours, etc.

In questioning witnesses it is important to find out: when and under what circumstances the witness arrived at the scene of the crime; what were the conditions of his observation of the event; who was killed; what his relations with the victim were; who perpetrated the murder; how many offenders there were; what they called each other; what they looked like and what they had on; with what weapon (tool) and in what way blows and injuries were inflicted; whether or not the murderers had any things with them; whether or not they used any transport (if they did, what the characteristics of the vehicle were and what direction they had come from); what preceded the murder; whether or not the offenders were acquainted with the victim; what they talked about with him and what they called him; whether or not they took away anything belonging to the victim; and in what direction they left. At the end of the interrogation, it is imperative to ascertain who else might have been an eyewitness to the crime; what took place on the scene of the crime after the murder was committed; what alterations were made in the details of the scene.

Persons first to discover a body should be asked when they discovered it, from what direction they arrived at the scene and whom they met there, whether or not they saw anyone who looked suspicious in appearance or behaviour. It is also necessary to find out where exactly and in what position the body was lying at the moment of discovery, whether or not the witness (or other persons) changed the position of the body or of the surrounding objects, and if he did — why and how.

When questioning a victim's family, neighbours and colleagues, the investigator should ascertain the circumstances preceding the murder, the victim's connections and relationships with the people he was in contact with and, especially, his behaviour shortly before his death. To this end, witnesses should be asked such questions as:

— where and when they last saw the victim alive; where he was going, what he was doing or what he intended to do;

— whether or not he was alone, and if he was not, who was with him or what that other person looked like;

— why the victim happened to be in the place where he was killed;

— how he had spent the last few days of his life, whom he was seeing or wished to see, who came to see him or made inquiries about him;

— whether or not the victim's customary mode of life or behaviour had somewhat changed in the last few days and in what way;

— whether or not he expressed any fears for his life or, on the contrary, any threats with respect to certain persons.

When questioning a victim's family, the investigator should ask them to show him the victim's telephone books, notebooks and calendars, his correspondence and other materials, thereby trying to gain additional information.

Forensic-Medical Examination. After examining a body at the scene of discovery, the investigator appoints a forensic-medical examination.

It is usually conducted by the forensic-medical expert who took part in the examination of the body on the scene or, failing that, by some other expert. An expert examination helps to elucidate many points in question. Besides, an expert's opinion may provide information determining the course of inquiry.

An expert is usually asked to solve the following questions that have a general character: what caused the victim's death; when it occurred; what injuries there are on the body; their nature; their location and origin (what they were inflicted with); which injuries including fatal ones were inflicted when the victim was still alive, and which after death; whether these fatal injuries may have been self-inflicted or whether this possibility is to be ruled out; what the victim's position was at the moment the injuries were inflicted; whether or not he could have acted in any way after the injuries were inflicted, for example, move about or shout; whether the injuries caused profuse bleeding; whether death occurred immediately after one of the injuries was inflicted (which one exactly), and if not at once, when; whether or not the body's position has been changed, what its original position was; whether or not there are signs of self-defence on the body; whether the victim drank any alcohol, how much and how long before death; whether the victim ate any food before death, how long before death and what kind; what the victim's blood group is.

Besides questions of a general character, an expert is to answer questions pertaining to the specific features of one or another mode of killing. For example, in case of injuries produced by a sharp or blunt instrument the questions may be: what are the type and shape of instrument with which each injury was inflicted, what the instrument looks like; whether or not there are any marks on the victim's body of some specific characteristics of the instrument; what was the force of the blow causing each injury.

In case of death resulting from strangulation or suffocation, it should be ascertained whether death was caused by hanging, strangling or suffocating, as, e. g., with hands or some soft object; and whether the strangling groove is an ante-mortem or post-mortem one.

In case of recovering a body from water, the questions to be elucidated are: whether death was caused by asphyxia, e. g., as a result of water getting into the respiratory organs, or whether death occurred before the body entered the water; in the latter case, it is essential to ascertain what it was caused by; whether there are any ante-mortem injuries on the body, what their origin is and whether or not they could have caused death; in case there are some post-mortem injuries on the body, what they could have been caused by; how long the body had been in the water and how soon after the occurrence of the victim's death it got there.

If a woman happens to be the victim, it may be necessary to ask some additional questions: whether or not she had a sex life; whether there are any indications of the victim's having had sexual intercourse immediately before death, such as semen found in her genitals (or on some other parts of her body), what its group is; whether there are any injuries on the victim's body characteristic of a violent sexual assault; whether or not she was pregnant and if she was, how many months; whether or not there are any signs of an abortion, and if there are, in what way it was performed; whether or not the victim had borne children previously, whether she was in a post-natal condition at the moment of death, and if she was — how soon after childbirth.

The investigation of some murders requires complex expert examinations. In a case of murder by firearms, a complex (forensic-medical and forensic-ballistic) expert examination may be appointed to solve such questions as: how many shots caused the injury; whether the injuries were caused by one weapon or by several; what type, calibre and make the weapon is; from what direction the shot was fired and where the entrance and exit bullet wounds are; from what distance from the victim the shot was fired; whether or not any traces of a close-fired shot were found on the victim's body or clothes, and if they were, what is the particular place and what the traces are.

If the investigation fails to identify a body, an expert may be asked a number of additional questions. A forensic-medical examination may in such cases give the investigator valuable information that will help to establish the victim's identity. If, for example, only a skull or separate parts of a body are found, the expert may be asked about the sex, height and age of the victim. It is desirable that the colour of the victim's hair and eyes should also be determined. Of great importance is the question if there are any characteristic marks on the body's hands and feet that indicate the victim's occupation. It is also essential to establish the victim's individual characteristics, such as: his dental structure (missing teeth, traces of treatment, fixed or removable dentures), post-operative scars, traces of bone fractures, other changes due to disease, and physical defects.

Besides, if the victim's face is in an unidentifiable state, the forensic-medical expert reconstructs the face to give it its ante-mortem appearance. Identification photographing should be done before as well as after the reconstruction.

In case of discovering parts of a dismembered body, the expert should also be asked the following questions, besides the ones listed above: whether or not all the discovered parts belong to one and the same body; whether the body was dismembered (or parts severed) while the victim was still alive or after his death; how soon after death and with what instrument the dismemberment was performed; whether or not the person performing the dismemberment knew anatomy.

If an expert's opinion is not sufficiently grounded or is rather contradictory and faulty, there may arise a need for a repeated examination of the body. In such cases, the investigator orders that the body should be exhumed (taken out of the grave). The body is also to be exhumed if it has to be identified.

Interrogation of the Accused. Testimony given by an accused (suspect) is of great importance for the establishment of all the facts related to the crime in question. Being interested in the outcome, the accused decides upon a certain course of action during his interrogation. He may plead guilty or partially guilty to the crime, or he may flatly deny his participation in the murder. In the latter case, he may be guided by his desire to escape responsibility or he may really be innocent. A confession may be made for the purpose of concealing the real murderer.

If an accused confesses to having committed the crime, his interrogation should be carried out in such a way as to obtain from him detailed evidence on all the circumstances bearing on the preparation and commission of the murder, and also to find out additional sources of information from him that would either corroborate or disprove his evidence. When an accused denies his being party to the crime, the tactics of interrogation should be aimed at detecting and exposing his false evidence and inducing him to give truthful evidence. An accused should be questioned in particular detail if he pleads an alibi. Verification of testimony in all its details helps to check upon the alibi even if there is some preliminary agreement between the accused and other persons to this effect. Sometimes the accused may assert that the murder was committed in his presence by another person. Such evidence is also subject to thorough verification.

In questioning an accused, the investigator should find out when the intention of murder was formed and what its motives were; the origin, nature and characteristics of the criminal weapons and means and where they were kept after the murder; the mode of gaining access to the scene of the murder; the time of the commission of the crime; the modes of assaulting the victim, and other circumstances related to causing death; the origin of the traces on the accused person's clothes, shoes and body in relation to the murder; the measures taken by the accused to eliminate these traces, and other actions taken by him to conceal the crime and his guilt; the caches, and the appearance of objects stolen during the murder, etc. The investigator concretely specifies all his questions so that the answers to them would contain direct or indirect indications of the modes and sources of their verification. The persons named by the accused must be questioned, the objects mentioned by him found, removed, examined and presented for identification. To ascertain the accused's claim of death by misadventure, or resulting from an accidental shot or suicide and also to ascertain the other testimony given by him, an investigatory experiment may be carried out with the participation of an expert in forensic medicine, ballistics or some other field. To verify the testimony given by the accused, the investigator may, if necessary, appoint a corresponding expert examination.

4. Nature of Investigation Depending on Methods of Murder

A murder by a firearm belonging to the victim or to some other persons is sometimes given an appearance of suicide or accident. In this case, the murderer leaves the weapon beside the body. When inspecting the scene, it is necessary to make a thorough examination of everything, to take precise measurements, photographs and notes in the report concerning the relative position of the body and weapon, the injuries to the victim's clothes and body, the nature of the weapon and traces left on it. Since suicide with the help of firearms is only possible if the shot is fired pointblank or from a close distance, the report must contain notes of the presence of marks indicating the action of firearms and their character. These marks are looked for both around the bulletwound and on the victim's hands.

To solve a number of questions relating to the use of firearms, an investigatory experiment is carried out and forensic expert examinations are appointed whose results may give sufficient ground to rule out suicide or an accidental shot. But data pointing to a possibility of suicide or an accidental shot do not in themselves exclude murder, since the murderer could have fired from any distance and with the victim being in any position.

Bodily injuries caused by stabbing and cutting weapons found on such parts of the victim's body that render their self-infliction physically impossible are sufficient grounds for constructing a theory about disguised murder.

A forensic-medical examination helps to establish typical and untypical signs of suicide and murder committed by sharp weapons. Infliction of wounds by stabbing weapons (awl, scissors) is characteristic of murder. Slashing weapons like axes and cleavers are also used for murder.

The staging of suicide by hanging is most often resorted to in case of murder without open wounds: in case of strangling by means of hands or a noose, poisoning, or injuring only internal organs by means of blows with a blunt instrument. Hanging as a mode of murder is characterised by the involvement of several persons. In most cases, it is used to murder persons who are highly intoxicated or very weak.

The examination of a scene with a body found in a noose requires the measuring and noting of the distances between the ground (floor) and soles of the victim's feet, and between the victim's neck and the supporting object; the length of the rope and each of its parts. When taking down the body, the knot is not untied, and the noose is cut at the side opposite to the knot. Additional information concerning the faking of suicide by hanging may be obtained in an investigatory experiment and a forensic-medical examination. For example, an expert examination may reveal signs of strangulation by hand and other signs of violent death caused by another person. A forensic-medical expert may also answer the question whether the strangling groove appeared at the moment of death or after it.

The faking of non-violent death as a means of concealing murder is most often resorted to when the victim is a sick or elderly person, in the hope that his death will be regarded as a consequence of illness or old age. The usual mode of killing in such cases is poisoning. If death takes place as a result of poisoning with some substance, the theories to be verified are: murder by poisoning, death resulting from negligent use of poisonous substances, and suicide. During the examination of the scene, to be removed are poisons, very powerful medicines, their packaging, prescriptions, receptacles containing the remains of the substance that might have been used for poisoning. Upon establishing the substance which caused the poisoning, the investigator should find out how the victim came in its possession, where, from whom, when and for what purpose it was obtained.

In missing persons and supposed murder cases, the first investigatory activities usually are: an inspection of the missing person's flat and work-place, and of the supposed site of murder, the questioning of witnesses and the examination of the missing person's documents and belongings. The task of the inspection is to elucidate data about the missing person's identity and intentions, and detect signs of murder, such as: traces of a shot, blood, particles of muscle and bone tissue, brain matter, and also any signs of attempts at camouflaging and destroying the traces. During an inspection, the investigator may find traces that would help to identify a person in case an unidentified body is discovered; items disproving the theory of the missing person's departure; clues pointing to the commission of murder at the site being examined; weapons that could have been used to murder a person and dismember his body, and also parts of a body. The circumstances of disappearance may be apparent from the missing person's articles of clothing, personal belongings, documents, letters, photographs, notes and other things found during the examination. If there is sufficient reason to believe that traces of murder may be destroyed or concealed by the interested persons, it is necessary to make a search.

To be ascertained in the first stage of the investigation, when questioning the persons who declared a person missing, the missing person's family, relatives, neighbours and other people who knew him, are the circumstances of disappearance, the missing person's distinctive marks and background; characteristics of his clothes, shoes, documents, valuables and other things; his mode of life, especially of late, his friends, his relations with people he was in contact with, possible reasons for his disappearance; what measures the people who knew him took to find the missing person besides applying to the militia; when, where, with whom, and under what circumstances he was last seen; how the person being questioned can explain the disappearance; what facts his opinion is based on.

Essential information is gained from examining the missing person's documents. They reveal the places of his studies, work, army service, etc. Proceeding from these data, the investigator broadens his knowledge of the missing person's contacts and of the people who may be questioned with respect to the case.

To check upon the theory that the missing person is alive, a local search is carried out. The choice of directions and methods of the search is determined by the specific theories of his whereabouts.

Questions of the scope, directions and methods of search for the body are based on the theories concerning the place and causes of death, and also on possible modes of concealing the missing person's remains. Besides, in each case of murder "without a body", it is imperative that the centralised missing persons and unidentified bodies card files should be consulted. A search for a body often entails great difficulties because the criminal uses different ways and means of concealing the crime. In some cases, the murderer takes his victim to a remote place, far from the victim's home, where he perpetrates the conceived murder; in other cases, the criminal kills the person at his own place or in the victim's home, after which he dismembers the body and hides its parts in different places or in his own premises (in his home or yard). When searching for a body, the investigator should get hold of all currently available information about unidentified bodies discovered in the period corresponding to the time, since the person being sought was declared missing.

Upon the discovery of the missing person's body, a forensic-medical expert is to establish the cause, time, and other circumstances of death. In case the body cannot be found, the fact of crime is established by circumstantial evidence (the finding of traces testifying to the commission and concealment of murder and of the missing person's personal belongings, the existence of certain persons interested in his death; certain "behaviour clues", such as the accused's making up artificial proofs, his evasion of investigative bodies and court, his showing knowledge that can only be attributed to his direct participation in the murder).

Investigation of "trunk murders" (murders with dismemberment) has certain characteristic features of its own.

The following set of initial investigatory and operative-search activities should be performed in case of discovering parts of an unidentified person's body in different places:

— inspection of the scene of the event at all the sites where parts of the body were discovered;

— inspection of all the real evidence found on the scene of the event, e. g., packaging, to detect traces peculiar to these specific objects and the murderer's traces on them;

— questioning of the witnesses who discovered parts of the body and of other persons in possession of information about the victim, murderer and other circumstances of the crime;

— detective measures aimed at identifying the victim and establishing the circumstances of the murder;

— a forensic-medical examination of the discovered parts of the body to establish whether they belong to one person, to a man or woman, to determine the victim's age, the time of death, its causes, and the mode of dismemberment.

The establishment of the mode of dismemberment may throw light on the circumstances, conditions and place of the body's dismemberment. The establishment of the tool of dismemberment helps to disclose the mechanism of dismemberment and sometimes makes it possible to judge about the offender's skills. The examination and analysis of the packaging may be essential in tracking down the murderer. As a general rule, dismemberment of a body is perfomed by murderers who are closely associated with the victim and try to conceal the scene of the crime.

CHAPTER XXVII

INVESTIGATING RAPE

1. Criminalistic Characteristics of Rape

Rape is sexual intercourse using force, threats or taking advantage of the victim's helpless situation. Rape is one of the most cynical of crimes which violates an individual's health, freedom and dignity. In certain cases, rape entails serious consequences which make the crime similar in its gravity to the most serious socially dangerous acts.

In determining the criminalistic characteristics of this crime, it is important to distinguish the following typical situations where rape most often occurs: (1) the rapist, while at a party, wedding reception, etc., takes advantage of the victim's trust and often of an inebriated condition in order to lure her to a secluded spot with the intent to rape; (2) the rapist meets the victim in a public place (in a restaurant, on the beach, etc.) and, through deceit, lures her to a solitary place where the rape is committed; (3) the rapist, while behind the wheel of a vehicle (car, motorboat) meets the victim and offers to either give her a ride or to take her to a given destination. Along the way, against her will, the rapist takes her to a secluded spot with the intent to rape her; (4) the rapist meets the victim by chance in a secluded area (forest, park) and suddenly attacks her; (5) the rapist tracks the victim beforehand and, secretly following her to a solitary place, suddenly attacks her; (6) the rapist either meets a minor by chance or intentionally follows her (this often takes place in courtyards, near day-care centres and school buildings) and, through deceit, lures her into a secluded area and rapes her.

Incidents of group rape which are committed by more than one individual in situations similar to the aforementioned constitute a special group.

The most common and widespread methods used by criminals to prepare the victim, commit the rape, and conceal the traces, are as follows: (1) putting the victim into a helpless position through the use of alcohol, or narcotics, or by inducing an unconscious state through the use of brute physical force (choking, beating, etc.); (2) overcoming the victim's resistance by using psychological pressure (threatening with a weapon, blackmail or by taking advantage of the victim's subordinate professional position or dependent situation). A confirmed rapist often prepares himself well in advance to committing the rape: he chooses the scene of the rape, prepares the means of rendering the victim helpless and tracks the victim of the intended rape. These actions are also characteristic of those individuals suffering from some forms of mental illness.

The following is a list of means typically used to conceal a rape: (1) destroying traces of the crime such as stains from semen or blood or traces which might indicate the criminal's presence at a given location at a given time; (2) committing the rape in such a way so that it is difficult for the victim to identify the attacker (rendering the victim unconscious before the rape or using a mask to hide the attacker's face).

Traces and other alterations in the physical environment which inevitably occur as the result of a rape have an important significance in criminal investigation. In any sort of residence such traces may be feminine personal effects scattered about, a rumpled bed, overturned furniture, etc.; on bedding and clothing, traces of semen and bloodstains may be found; on dishes and other such domestic articles fingerprints, as well as footprints on the floors may be found. In open areas it is characteristic to find the soil has been trampled or dug up, and plants and bushes have been crushed or broken. Foot- and handprints may be found on the ground as well as various personal effects left by either the attacker or the victim.

The consequences of rape, as has been proven in investigatory practice and judicial proceedings may be extremely grave (either the death of the victim as a direct result of the action of the rape, or her suicide following the crime). Rape may also cause certain psychological disorders in the victim and may lead to physical injury or infection with venereal disease. In those cases where the victim was of prepubescent age, rape may cause loss of virginity and may lead to pregnancy and the need for abortion.

Those who commit rape often abuse alcohol and are extremely cruel and egocentric individuals.

There are also cases of rape committed by individuals who suffer from certain forms of mental illness. For some of these people, an increased sex drive is characteristic.

The motive for most rapes is the desire of the rapist to satisfy his sexual passion. All the same, there are instances of different motivation. For example, one such motive is the desire of a deceived lover or a spurned suitor for revenge. Investigatory practice is also acquainted with instances of rape (especially group rape) committed as delinquent behaviour. As a rule, these rapes are committed by minors who wish to prove that they are "real men" and already adults.

A character profile of the victim is important in establishing those character traits which might invite rape. Most important among these are an excessive trustfulness, a marked imprudence or carelessness, and in certain cases, the frivolous or even amoral behaviour of some victims who, under certain circumstances, had every opportunity not to fall into a situation which could lead to rape (not be tempted to use alcohol, etc.).

2. Investigatory Theories and Investigation Planning

While charges are brought in the case of such crimes only on the insistence of the victim, the latter has no right to request that charges already brought against a suspect be dropped. The victim may bring action against the suspect only in a written or oral request.

Only in the presence of qualifying conditions may criminal charges be brought against a suspect without the victim's request.

In deciding the question of whether or not to bring charges against a suspect, it is imperative to establish, on the basis of sufficient evidence, that the intercourse took place against the will of the petitioner (victim) as a result of physical force, threats or owing to a condition of vulnerability (on the part of the victim). This may be established by the presence of bodily injury to the victim, traces of beating, damage to clothing, the use of narcotics, and so forth.

One of the specific features of criminal cases dealing with rape is the necessity of careful preliminary investigation of the statement of rape when the decision is being made as to the bringing of criminal charges. The victim's statement is insufficient evidence for bringing such charges in that the information contained therein may eventually prove to be false. Of course, in those instances where the victim's complaint contains concrete and persuasive evidence, and the circumstances surrounding its presentation undoubtedly show an accomplished rape it is imperative that criminal charges be brought immediately, without resorting to preliminary investigation of the complaint.

Preliminary investigation is done in those cases where information has been received about rape under qualifying circumstances. In such instances, this information may come not from the victim, but from a third party. The conditions for conducting such investigations which are fixed by law stipulate that the investigator, within a very short period of time, must receive objective data about the signs of the crime. Because of this, it is the investigator's right to take statements from the victim and other individuals, to demand medical certificates and other papers and to examine the scene of the rape before any charges have officially been brought.

In rape cases, it is usual for the investigator to have, from the very beginning, detailed information as to the conditions surrounding the rape and about the individual suspected of committing the crime. This information is contained in the victim's own statement as well as in the statements given by the individual identified as the attacker. On the basis of this information, the investigator has every possibility of initiating the investigatory theories and verifying them.

As a rule, it is important to establish the validity of the following in the initial period of the investigation: (1) that the rape actually did occur; (2) that the rape was committed by the suspect identified by the victim; (3) if there was no rape, then the intercourse took place with the victim's consent; and (4) that there was no intercourse at all and the victim's statement was falsified.

Actual investigative measures are, to a great degree, conditioned by typical situations which arise in the early stages of the investigation. The first of these occurs when the victim knows her attacker, and the second is when the rape was committed by a stranger.

In those cases when the victim accuses an acquaintance, it is up to the investigator to prove whether or not he is actually guilty of the crime. The suspect's own theory of the events put forward on his own behalf is simultaneously verified.

Partial analysis of crimes committed shows that in the overwhelming majority of cases (more than two-thirds), the suspect maintains that the intercourse took place with the consent of the victim.

A successful investigation is guaranteed only in those cases where the investigator persistently and consistently verifies the statements of both the victim and the suspect.

When checking out the statement that the intercourse was voluntary, the investigator must clarify first and foremost, whether or not the suspect used force (or the threat of force) to perform the sexual act. The investigator first of all conducts an examination of the scene of the crime, searches the suspect's apartment, examines the suspect's clothing. He also examines the victim as well as the suspect and takes statements from any witnesses.

If the suspect admits the meeting with the victim but denies having sex with her, the following is done: the victim and the suspect are examined by a physician, a search is conducted for evidence that the victim and the suspect were present on the scene, and the victim is questioned as to the conditions surrounding the crime.

When the victim does not know the rapist, the versions of events are verified in a specific way. In those cases, the identity of the attacker must be established, and any real evidence must be shown to belong to the attacker (any traces or objects discovered on the scene). It is imperative to interrogate the victim, to examine the scene, to question witnesses and to prescribe forensic-medical examination of the victim.

As soon as the investigator is aware of the existence of a suspect in a rape case, a series of investigatory activities are undertaken with an aim to verifying the individual's alibi (rape suspects are insistent about the truth of their alibis). Together with these activities, the suspect is presented for identification by the victim and witnesses, examination is performed and, when necessary, the suspect is subjected to forensic-medical examination.

When investigating an attempted rape, the investigator often suggests and verifies theories which attempt to answer the following questions: did an attempt to rape actually occur, or is the would-be victim confused about the nature of the actions (insult, bodily injury, hooliganism, beatings, etc.); is the victim's accusation falsified with the intent to compromise the suspect; is the refusal to perform rape a voluntary one, one which would exclude criminal intent?

In conjunction with the indicated theories, a series of investigatory activities are planned: interrogation and medical examination of the victim and the suspect, examination of the scene and questioning the witnesses.

In rape cases, certain search measures must be planned in conjunction with the investigation. These measures are intended to hasten the search for a suspect, to identify witnesses to the crime and to aid the investigator in fulfilling his other tasks. In those cases where the suspect is unidentified, it is extremely important to get information as quickly as possible (having to do with the conditions surrounding the crime and the physical appearance of the suspect), and to organise a hot pursuit. The quicker the search for the suspect is begun, the more fully and effectively search measures may be used. In this way, search dogs may be effectively used only immediately after the crime has been committed.

In order to cordon off in time, those areas where the suspect may be hiding, it is imperative to enlist the cooperation of the local authorities and the mass media, and to make full use of all available means of communication.

In those instances where the information about a rape is received with some delay (victims do not always immediately file a complaint), the victim and any witnesses are questioned and the local law-enforcement bodies are informed as to the suspect's appearance and possible residence so that a search may be immediately organised. Descriptions of the suspect should be distributed not only among the branches of the local law enforcement bodies, but to transportation departments, so that patrols and check-points may be set up to detain the suspect at train stations, airports, on piers, on the road, etc.

Organising patrols in public places and setting up road-blocks and observation points can prove helpful in the search for the suspect.

A plan of investigation may be considered complete only when all necessary steps have been taken to uncover and eliminate all factors and conditions which were conducive to the rape.

3. Tactics of Investigatory Activities

Interrogating a victim of rape is a complex action, which requires a great deal of tact and professionalism on the part of the investigator. This, in large part, involves overcoming the victim's natural reticence during the questioning. It is important to conduct the questioning in such a way so that the victim is assured of complete confidentiality and fully understands that only her complete and honest testimony can assure that the criminal will be caught and brought to justice.

During questioning, the following circumstances surrounding the crime should be clarified: where, when and under what conditions was the rape committed; how did the victim come to be at the given location; what was the nature of the criminal's forcible actions; what was the nature of the force used (was it physical or psychological pressure, the use of weapons, etc.); did the attacker actually commit the sexual act; what traces may have been left on the scene; did the victim offer any resistance, and if so, what was its nature; are there any traces of that resistance, either on the victim's body or clothing, or on those of the attacker?

In addition to all this, it is imperative to establish, who else the victim told about the crime; did the victim have an active sex life before the rape; was she in a post-natal or any other vulnerable condition; did the victim seek medical aid; how was the victim, as well as the suspect, dressed; who might have seen them together on the scene?

If the attacker is unknown, then, in addition to the aforementioned details, it is important to determine the following: a description of the suspect, including a description of his gait, any characteristic gestures, specifics of his speech, voice, etc.; information as to his clothing and personal effects (eyeglasses, watch, cigarette lighter, cigarettes, etc.); information as to items stolen from the victim; data as to means of transportation the accused might have used or have access to; information as to the specifics of the suspect's behaviour on the scene (did he attempt to hide his face, did he wear a mask or did he try to disguise himself with any sort of headwear).

If the victim knows her attacker, she is asked to give his full name, age, place of employment and position held, his address and any other information about him. She is also questioned as to the nature of their relationship (when and where they met, did they see each other often; were there any personal scores to be settled or mutual hostilities between them; did they ever have sex before; did they correspond; was their meeting accidental or pre-arranged; did they see each other after the rape, etc.).

The scene of the crime is, as a rule, *examined* immediately after the victim is questioned. One of the basic goals of such an examination is to verify whether or not information supplied by the victim corresponds to the actual conditions of the crime scene. To do so, it is important to carefully study the location of the scene, its lighting, the distance to the nearest road or residential buildings. If the crime was committed in some building, then it must be determined whether the building is a residential or commercial one, where it is located, next to what, and what is the condition of its doors, windows, locks, etc. Another of the goals of the examination is to uncover any traces, or real evidence, which would bear witness to the forced nature of the sexual intercourse (the condition of the place where the rape occurred: overturned and scattered objects, spots which look like either blood or semen, etc). And finally, a third task of the examination is to uncover any traces which bear witness to the fact that the suspect was at the scene: footprints, handprints, vehicle tracks, personal effects such as pieces of clothing belonging to either the rapist or the victim (handkerchiefs, buttons, pens, cuff-links, hats, scarves, gloves, etc.).

One of the most important ways of ensuring greater effectiveness in examining the scene is to include the victim in the examination. In these instances, the investigator may use the victim's participation to more purposefully conduct his investigatory activity. The victim may be able to show exactly where the rape occurred and in doing so she makes the search for real evidence much easier.

A forensic-medical examination of the victim of a rape is an urgent part of the investigation and is conducted in order to uncover traces which testify to sexual intercourse, its character and the consequences of violence, the degree of bodily injury, infection with venereal disease, etc.

The following questions are answered by the forensic-medical expert: (a) is the victim's hymen broken and, if so, how long has it been in this state; if not, could intercourse have taken place without breaking it; (b) is there evidence of recent sexual intercourse, and if so, what is its nature and location; (c) does the victim bear any marks of violence, and if so, what is their degree of gravity, where are they located and what is their appearance, how long have they been present and how were they produced; (d) does the victim show any evidence of venereal disease, and if so, what is the disease and how long has the victim been infected; (e) is the victim pregnant, and if so, how advanced is the pregnancy; (f) what is the blood type of the suspect (as determined by the semen)?

Interrogation of Witnesses. In a rape case, the following individuals may be called as witnesses: anyone who saw either the victim or the suspect at close range on the scene; anyone who might have accidentally witnessed the use of force, the sexual act itself, or other circumstances of the crime; anyone who has knowledge of the circumstances surrounding the crime, either gained from the victim, the suspect, or from other individuals; anyone who might be able to supply information about the victim or the suspect.

Witnesses are identified, as a rule, during the first interrogation of the victim and the suspect, or in the course of the search, or with the help of the public.

During questioning, the witnesses are informed about the confidentiality of the information they possess about the rape case. In his own turn, the investigator should not give away more information than necessary about the events surrounding the crime and the identity of the victim.

Interrogation of the witnesses should clarify the following: (a) those circumstances surrounding the rape which the witness personally saw or heard of from the victim or a third party; (b) when, where and what did the witness hear about the rape from the victim; what state was the victim in at that time, as well as what was the state of her clothing, personal effects, etc.; (c) what are the moral character traits of the suspect, the victim, their circle of friends, what are their interests, lifestyles, hobbies, occupations, etc.; (d) what is the nature of the relationship between the victim and the suspect; (e) who else might have been a witness to the events.

The tactical particulars of questioning witnesses in a rape case have to do, in large part, with the fact that those circumstances which need clarification often deal with the intimate aspects of the lives of the victim and the suspect. Difficulties also arise because often the witnesses are relatives or close friends of either the victim or the suspect.

Therefore, the investigator should carefully prepare for the interrogation, critically examining all evidence and thoroughly verifying it. The necessity of elucidating specific details concerning the crime and its intimate aspects demands a certain amount of tact on the part of the investigator as well as well-formulated questions. This is of particular importance when questioning minors where the discussion must be simple and easy to understand, while observing the recommended tactics of questioning.

Examination of a suspect, as a rule, precedes his forensic-medical examination in those instances when there is the danger that any marks left on his body may disappear in and of themselves, or be consciously destroyed before expert examination. The suspect is examined in order to find on his body any traces of the crime or special marks. During the examination, the suspect may be found to have certain injuries such as bruises, scratches, bites, etc.

The results of such an examination should be described in detail in the investigatory report showing the location of each injury, its shape, size, colour and any other features which may be used to determine when the injury occurred. With this in mind, it is recommended that forensic photography be used (preferably colour) which gives an impression as to the nature of the traces and makes the following forensic-medical examination much easier.

In addition to any injuries, other marks such as bloodstains and dirt, hair not belonging to the suspect may also be found on the suspect's body. Such traces and objects must be carefully removed and stored until they can be submitted for expert examination. Any traces found should be photographed and described in detail in the investigatory report.

Interrogating the Suspect (Accused). The suspect should be interrogated immediately after his arrest. The content and sequence of the interrogator's questions is conditioned by whether or not the victim is acquainted with the suspect. When questioning a suspect who is a stranger to the victim and who denies having met with her, it is wise to initially establish his whereabouts when the crime was supposed to have been committed, what he was doing at that time and who might have seen him. In addition, the suspect's clothing and shoes should be identified. If his clothing, shoes or body show signs of damage or injury, the origin of this damage must be ascertained. It should also be established whether or not his clothing or shoes had recently been sent for cleaning or repair and where they were during the time in question.

If the victim is acquainted with the suspect, it is best to begin the questioning with a detailed description of their relationship and a list of individuals who might attest to the character of this relationship.

The elucidation of the aforementioned points is very important as in the majority of cases the suspect (who was not "caught in the act") categorically denies either the very fact of the sexual act, or at least that it was of a violent nature. In the first case it must be determined where the suspect was during the time in question and who might be able to support his alibi. It is also useful to question the suspect as to reasons why the victim might, in his opinion, file a false complaint.

If the suspect does not deny the fact of sexual intercourse, but insists that it took place with the consent and willingness of both parties, it is recommended that he be given the opportunity to explain himself, on the basis of the established evidence which suggests a forcible nature of his actions in relation to the victim. Even in those situations where the fact of the rape is indisputable, and the suspect admits his guilt, it is important to establish the nature of his relationship with the victim in order to more fully and completely examine the facts and events pertaining to the rape. Such an explanation will also aid in gathering complete and objective evidence to establish the guilt of the suspect (accused).

CHAPTER XXVIII

INVESTIGATING CRIMINAL VIOLATIONS OF JOB SAFETY REGULATIONS

1. Criminalistic Characteristics of Job Safety Violations

Infringements on the regulations guaranteeing job safety (violations of rules governing work safety, sanitary conditions and others) are viewed as dangerous offences which involve criminal responsibility as described by laws pertaining to such cases. In the Soviet Union, officials in enterprises, institutions and organisations in one or another branch of the national economy may be held responsible for violations of general or specific job safety rules if these violations may cause accidents which could result in serious bodily injury leading to a loss of capacity to work or permanent disabitily or death.

Corpora delicti involving violations of job safety in the fields of mining, construction, sanitation and firefighting form a separate group. Similar crimes include those involving rules governing the use of construction machinery during building operations, industrial-technical discipline, rules guaranteeing safety on work-sites where there are explosive materials being used or manufactured, and rules dealing with the storage, use, registration and transportation of explosive or radioactive substances or explosives.

The connection between the incident under investigation and specific manufacturing or technological processes and types of production, and the distinct nature of the rules of manufacturing and sanitary safety, condition the existence, within the general methodology of investigating criminal violations of occupational safety, of specific features characteristic of such investigations in various sectors of the national economy and in various manufacturing sectors. In spite of these specific features, criminalistic analysis of job safety violations makes it possible to reveal a number of general characteristics of such violations, to expose their characteristic traces, and to ascertain which are the most common types of violations.

Depending on the way in which the crime is committed, expressed in actions or inactions, contradictory to the demands of job safety rules, on the part of officials, the following criminal violations may be indicated as most common:

(1) Allowing untrained or poorly-trained individuals to do a specific job. Practice shows that individuals who lack sufficient training, or who don't have the proper training, are often allowed to perform various production tasks or to run certain types of machinery. It is also common for individuals who do not have the necessary training, or who are not authorised for such work to be allowed to perform the same tasks. Examples of such violations would be to send another specialist in the place of a mechanic on a job to fix certain equipment, or to substitute auxiliary workers for machine operators, or to give the responsibility of a signalman in a loading operation to an inexperienced hoister, or to send a turret crane operator to work on a shaft crane without special preparation, and so forth.

(2) Giving work orders and directives which are contradictory to job safety rules. To this group of violations belong directives given by officials to do a job without first receiving the go-ahead from the necessary authorities when such an authorisation is required by the job safety rules. Similar to the foregoing is a directive given for a job to be done when the individuals responsible for guaranteeing the safety of the workers are absent. Also in this category are instructions for work to be done in a certain way or under certain conditions which create an increased element of risk for the individuals performing the task; permission to do a job using defective equipment or instruments which may not be used to perform the given job when individual safety equipment is unavailable.

Examples of the foregoing are directives which call for excavating or hoisting work to be done in an area where underground or aerial electric transmissions are without the permission of the energy inspectorate; orders for loading (by hand) containers of volatile liquids, or for doing electrical welding work in rainy weather, using an open flame near explosive or highly flammable materials, using ungrounded instruments or tools which give off sparks, performing construction assembly work on a live electrical installation without having an official from the necessary department nearby, working with volatile substances in the absence of reserve overalls and individual protective devices.

(3) Making changes or alterations in technological processes, in the design of machinery and mechanisms, publishing instructions which contradict the demands of job safety rules. These violations are committed by individual officials who are responsible for the organisation of manufacturing as a whole, or who are responsible only for the normal functioning of various subdivisions of an enterprise. More specifically, these violations occur when internal instructions include regulations directly contradictory to general and specific job safety regulations for that branch. They also refer to the inclusion of data dealing with maximal loads, speeds and work regimes included in the instructions for the repair and use of equipment which do not coincide with the data included in the original instructions accompanying the equipment and the instructions provided by the manufacturer. Finally, these violations include also those directives concerning the use of unsuitable parts for repairing a certain machine or piece of equipment, the alteration of designs for ventilation mechanisms, safety barriers and the use of raw materials and fuel which are different than those originally called for.

(4) Unsatisfactory training of workers responsible for occupational safety. The most common types of violations in this area are, as a rule, the lack of any kind of instruction in job safety, poor quality or incomplete training. In concrete terms, these violations are seen in the fact that officials in a given enterprise fail to conduct mandatory instruction in job safety, or fail to conduct refresher courses which are necessary when there are changes in technological processes. Substituting written directives or memorandums for the mandatory instruction in job safety, not meeting the deadline for such instruction, deviating from the prescribed programme of instruction for specific groups of workers and shortening the period of instruction are also violations of this type. Finally, a purely formal attitude toward the value of job safety technology instructions and violations of the existing rules and deadlines for re-qualification of workers in given areas fall into this category.

(5) Unsatisfactory supervision of the operating condition of equipment and safety equipment. This type of violation includes the failure on the part of officials to fulfill their responsibilities to keep new and used equipment in good repair. Often this is seen in the lack of regular and timely preventative inspection of machinery, individual mechanisms, safety barriers, fuses, blocking and signalling systems, ventila-

tion and individual safety equipment. It is aslo seen in the violation of recommended deadlines for removal of machinery from active use for repair, in the lack of technical inspection and testing of newly installed machinery and parts, and in the lack of inspection and testing of mechanisms before they are returned to use after repair.

(6) Unsatisfactory supervision of safe work methods. This refers to the situation where an official fails to conduct constant and systematic supervision of work methods to ascertain whether or not job safety regulations are being observed in practice. It also refers to those cases where the official is simply absent in a situation which requires, according to existing rules, his presence and supervision of the actions of his employees.

(7) Unsatisfactory organisation of work and related safety measures. Such violations are often expressed in a misunderstanding of the degree of danger involved in a given job, danger zones and their boundaries and in failure to guarantee job safety on their territories (the absence of fences, lighting, etc.). They are also seen in an incorrect estimation of the number of workers needed to guarantee job safety, in the wrong positioning of machinery and the wrong organisation of the work area, and in the lack of individual protective devices for every worker. Other violations include the lack of proper sanitary-hygienic conditions and preventative measures (lack of shower rooms and decontamination equipment on the site, lack of regular medical examinations, etc).

The crime in question is not confined, as a rule, to a single violation of one or another rule of job safety or industrial hygiene, but is often composed of a number of violations of a series of regulations. Thus, the assignment of a worker to a job which is not his speciality is often combined with a lack of necessary instructions and unsatisfactory supervision in the area of job safety.

A peculiarity of this type of crime is the presence of a complex cause-and-effect connection between the violation and its results. Violations inevitably entail a number of dangerous consequences. Depending on the character of the violation, these consequences may be in the area of technical or organisational aspects of the production process, or in the area of industrial sanitary concerns. Therefore, it is accepted practice to divide the causes of accidents into the following categories: technical, organisational and sanitary-hygienic. The first category includes causes of a technical nature which deal with improper repair and use of equipment, with hidden defects in parts and assemblies, and design defects in individual mechanisms and units. Organisational causes are those dealing with the unsatisfactory organisation of either the entire production process or its individual components, poor organisation of the work area, careless placement of machinery, improper assignment of workers and so forth. The group of sanitary-hygienic causes includes those various production-related environmental factors which might have a dangerous effect on the human body (extreme temperatures, noise, work areas containing large concentrations of gases or dust, etc).

Dangerous consequences may be the result of either a single cause, or a complex of various causes. Thus, defective ventilation equipment as a result of improper repair (a technical violation) will cause high concentrations of gases in the work area (a sanitary-hygienic violation) which, when individual protective devices are lacking (an organisational violation) may lead to accidents.

The crime under consideration is often accompanied by various traces which allow the following to be established: the specific job safety regulations which were violated, the guilty parties and the conditions under which the accident occurred. Often, these traces remain on the scene and are preserved in documentation dealing with the performance of the job during which the accident took place. This information often indicates, specifically, the regulations which were violated and the individuals responsible for them. Such forms of documentation include registration logs for instructions on job safety, log-books for machinery and mechanisms, orders for the performance of one or another job, certificates and licences granting the right to operate specific equipment or to do a specific job, orders for special clothing and individual protective devices and orders to issue raw and other materials, tools, schedules of preventative inspection and repair of equipment. Other forms include schedules of medical examination of workers, re-qualification, documented evidence of exams and testing on the rules of job safety orders for assignment and placement of workers on the job-site, and orders charging them with the responsibility of verifying that job safety rules and regulations are being followed, sets of work safety instructions, etc.

Direct or indirect reflection in the given documents of an official's actions, the presence and nature of commentary contained therein, or the absence of such documentation whose compilation is required by corresponding instructions, often testifies to that official's improper fulfillment of his responsibilities for guaranteeing job safety. Thus, the absence of written authorisation to perform jobs entailing an increased risk of danger, indicates a gross violation of job safety regulations which could lead to an accident. Violation of the schedule for medical examination is similarly evidence of a violation of industrial hygiene regulations which could place the workers' health in jeopardy.

Important information as to causes and conditions surrounding accidents is contained in distinct traces found on the scene (the work area where the accident took place). Establishing the scene of the accident and its boundaries is sometimes fraught with difficulties which arise wherever the causes of the accident are linked with the actions of other enterprises and organisations. Another such difficulty arises when a certain amount of time has elapsed between the job itself and the resulting negative consequences.

Traces found on the scene of the accident will often indicate the following:

— abnormal working conditions (extremes in temperatures and humidity, large concentrations of dust, poisonous chemical substances, ionizing radiation, poor lighting, etc.);

— a condition of the equipment the victim was operating, the techniques of the job and the stage of the work process at the time of the accident. All of this is indicated by the equipment, instruments, raw materials, semi-processed items and traces on parts which indicate which tools and devices were used in their processing and which specific operations were performed. Other indicators include evidence of the action of flames, gas and/or electric welding tools and toxic substances on individual parts and machinery, and finally, traces left in the course of securing loads and data from measuring and registering instruments;

— the actual technical causes of the accident. These traces are those which show damage to individual parts of machinery and mechanisms, defective instruments and devices, traces from short circuiting, defects in control and measuring devices, in blocking and signalling systems and in individual safety equipment, etc.

Criminalistic analysis of violations in job safety rules shows that in certain instances officials, responsible for observing these rules on the scene where an accident has occurred, often attempt, through various means, to conceal these violations.

The conditions on the scene of the accident may be altered and any real evidence may be destroyed, individual documents may either be destroyed or their contents altered, post-dated directives and orders are issued, documents which vindicate the guilty party are compiled (for example, the victim's signature is forged in the instruction log-book for job safety techniques, fake lists for issuing protective devices are prepared, defective equipment is quickly repaired and defective safety equipment is replaced with good).

Indications of such actions designed to coverup violations are corrections in, and additions to, handwritten or typed texts, traces of chemicals used to erase or alter documents, signs of forged signatures in documents, various negative conditions on the scene of the accident (obviously new protective barriers on moveable parts of older equipment, and so forth).

2. Investigatory Theories and Planning the Investigation

The investigation of crimes in the area of job safety presupposes careful elaboration and verification of accounts as to the essence of the crime in question and the conditions, causes and guilty parties involved.

In the majority of cases, one of the fundamental tasks early in the investigation is to establish the immediate causes for the accident. When information is limited as to the conditions surrounding the accident, existing theories as to the cause (or causes) have a general character and lead only to suggestions as to the nature of their probable cause: either technical, organisational or sanitary-hygienic. Further, as more information is received, these theories are made more detailed.

Establishing the immediate causes of an accident is a necessary condition for determining its basic cause. This, in turn, allows for the identification of the official who is responsible for violating established job safety regulations. In advancing a theory which states that the immediate cause of an accident is a violation of job safety regulations, it is important to keep in mind that other circumstances may also have played an important role: design defects in the machinery and mechanisms, hidden defects in the parts and assembly, actions on the part of a third party, or the victim himself, who grossly violated the rules of job safety. This obligates the investigator to suggest and verify other possible explanations of the accident together with the theory first proposed.

Indications as to the guilty parties are suggested by the investigator based on the nature of the violations of specific job safety regulations. They include, first and foremost, suggestions as to the involvement of any individuals among engineering or technical personnel who are directly responsible for observing job safety rules.

Theories as to the motivation for the crime are proposed, taking into account that it occurred due to criminal negligence or on the basis of careeristic motives. In terms of the latter, the accused often explains his actions by saying that he wished to avoid a work stoppage, to fulfill the plan on time, etc.

If one does not exclude the possibility that the resulting accident could have been caused equally by the action of any one of the possible conditions already suggested, then the decisive factor in solving the crime will be verifying the theory of a cause-and-effect connection between these circumstances and the resulting consequences.

Depending on the specific circumstances of the crime in question, various other theories may be advanced having to do with a connection between the accident and violations of safety regulations in other sectors of the enterprise, or in other organisations. Other theories may also suggest the presence of characteristics of a crime against individuals or an especially dangerous crime against the state.

Planning the investigation of an occupational safety crime has its own specifics conditioned by the nature of the given crime. The initial stages of the planning are affected by the character of the initial information available to the investigator.

In those instances where the initial information contains facts indicating the presence of a *corpus delicti*, an examination of the accident scene and the corpse (if there is one) is planned as an initial step. Also included in this stage is the seizure and examination of documents, the appointment of forensic-technical expert examination, forensic-medical examination of the victim, his interrogation (if possible), the interrogation of all witnesses to the accident and any individuals who are responsible for observing regulations for job safety.

If a significant amount of time passes between the time of the accident and the time the investigator receives information about it, the first step in investigation should be a careful analysis of all material received, as well as acquaintance with the enterprise's activity, technological processes and the specifics of its manufacture, and with those safety regulations in force in the given sector and the enterprise as a whole.

When information received by the investigating agencies does not contain concrete indications of job safety violations, the investigator must conduct a preliminary verification. To do this, he has the right to demand any necessary documents and to get explanations from the victim, any witnesses and officials. When it is necessary to answer any specialised questions, the investigator has the right to consult with the corresponding experts.

Materials dealing with departmental (internal) investigation serve to significantly aid the investigator in solving the problem of bringing criminal charges and in planning the course of the investigation and establishing the circumstances of the accident as well. In the USSR, in conjunction with the Statute on Investigation and Registration of Industrial Accidents, such investigation must take place within 24 hours and is conducted by a commission composed of the head of the shop (the manager of the corresponding sector), the senior public inspector for job safety and the safety engineer. Multiple accidents (that is, those involving more than one individual) and accidents having fatal consequences or other grave results, are investigated within a seven-day period by a commission consisting of a union technical inspector, representatives of the management, the trade union committee, and the higher economic agency (the plant manager is required to immediately notify the procurator of such instances).

The tasks of internal investigation are to give a detailed account of the accident, to determine its causes and to propose specific measures designed to rectify these deficiencies. The documents submitted by the aforementioned commissions to the investigative agencies (for example, the accident report, the technical inspector's findings, orders for the firm, directives for safety measures, diagrams or photographs of the site of the accident, explanations given by the victim and officials) as well as those materials resulting from internal investigation of multiple, serious and fatal accidents contain important factual data about the conditions surrounding the accident, analysis of its causes and conclusions drawn about the individuals who were responsible for observing job safety regulations on the site. All of this enables the investigator to immediately decide whether or not criminal charges should be brought and to plan further investigation.

If the internal investigation is being conducted parallel to the official investigation, the course of action should be formulated on the basis of the cooperation between the investigator and the technical inspector. This cooperation will aid in formulating the quickest explanation of the causes of the accident and the identification of the guilty parties.

In such criminal cases, the available resources of the crime detection and investigative agencies should be used to uncover the circumstances of the accident, its causes and those conditions which allowed for the commission of a crime. These same resources should also be used to identify any and all witnesses of the accident. The plan of investigation should indicate measures which call for public participation in general, and specifically, aid given by representatives of the enterprise who are familiar with the specifics of their work.

When planning investigatory activity, it is necessary to keep in mind that witnesses, victims and guilty parties are, as a rule, members of one and the same collective, and as such, know each other well. Therefore, investigative activity and other measures are always under the scrutiny of the other workers, including those individuals who have a vested interest in the proceedings.

The plan for investigatory activity should include provisions for measures involving the use of specialists who are familiar with the specifics of the given enterprise.

An important fundamental aspect of this plan is preventative measures. Depending on the specific circumstances surrounding the accident and its causes, the plan may include measures which are aimed at quickly removing those violations in technological processes, work discipline, job safety and other regulations which could lead to accidents.

If the causes of an accident at one specific site are found to be typical for other similar enterprises, or linked to the activity of another manufacturing organisation that these enterprises have in common (for example, an inadequate production process, design defects in equipment, the delivery of defective replacement parts or poor-quality raw materials), then this information is relayed to all enterprises involved.

3. Tactics of Investigatory Activity

The examination of an accident site involving criminal violations of job safety regulations is one of the most important and most complex of investigatory activities because of the specifics involved in its performance. Any delay in examining the site could result in the loss of evidence and alterations in the initial state of the site. These alterations may be due to the instability of various traces and changes in the conditions under which the accident occurred. In addition to these concerns, the interests of the given enterprise demand that the production process be returned to normal as quickly as possible. It should also be remembered that individuals with a vested interest in the circumstances of the accident (workers at the given enterprise) may also attempt to alter conditions.

Before leaving to examine the accident site, the investigator should do some preliminary work. Once having been informed of an accident, he should immediately contact the management of the enterprise where the accident occurred and give instructions to maintain the site untouched. If necessary, police officers may be sent there in order to guard the site until the investigator arrives.

The investigator must pay careful attention to preparing the technical means of finding, recording and removing traces from the accident site. In addition to those traditional tools which the investigator or criminalist carries with him, other supplementary devices should be prepared: various gauges, radiation gauges, instruments for indicating noise levels, humidity, instruments for taking air samples, etc. If the accident has caused significant damage to the site, the photographic equipment available to the investigator may be supplemented with a stereoscopic camera to aid in a more precise and complete recording of the accident conditions.

The specific character of a given accident site and other areas under investigation requires that various specialists be called in to aid in the investigation. These specialists are chosen by the investigator, keeping in mind the characteristics of the given enterprise and the specifics of the accident. In addition to a forensic-medical expert, whose participation is necessary when examining a corpse at the accident site, the investigator has the right to invite a radiation specialist, a mechanical engineer, a chemist, a job safety specialist and other individuals who possess the specialised knowledge he needs. It is a good idea to invite specialists who are from other organisations in order to avoid conflicts of interest in the course of the investigation.

The examination should be planned so that, insofar as it is possible, when conducted, it does not interfere with the duties of the employees at the site to work as usual. Care should also be taken that it does not interfere or cause difficulties for the manufacturing processes as a whole. At the same time, the personal safety of the investigators must be guaranteed.

If the criminal investigator and the union technical inspector arrive at the accident site at the same time, the investigator has first priority in examining the site and conducting other necessary activities. This does not, however, exclude the possibility that the investigator may request the participation of the union technical inspector, or may consult with him on one or another problem which may arise in the course of the examination.

After having questioned the victim and any witnesses as to the circumstances of the accident and having gotten the necessary information from the officials as to the nature and basic features of the enterprise, the investigator may begin his examination. The initial stage involves establishing the parameters of the site to be examined and its principal points which may be the machinery on which the job was being performed when the accident occurred, power plants, the victim's work area, the corpse, collective and individual protection devices, control and measuring equipment, safety and blocking mechanisms, etc. If difficulties arise in determining the parameters of the investigation, it is advisable to consult a specialist.

When examining the production premises, special attention is paid to their dimensions, the machinery on the site, its purpose and placement, the condition and dimensions of any passageways, the nature of the lighting, the number and power of the light sources, and warning signs, posters illustrating job safety, the condition of ventilation systems, etc.

When examining the machinery on which the victim was working, the following should be established: its condition, the presence of barriers and other safety devices, the condition of its assembly and individual parts and the position of control levers. Finally, the degree of damage resulting from the accident should be described in full detail. The control and measuring equipment should be examined as well as safety devices and means for automatic blocking. Their condition should be indicated. The data from instrumentation is recorded and entered into the investigative report while tapes from selfrecording instruments are removed and filed with the report.

When necessary, other units and manufacturing assemblies which are linked to the accident site by electric cables, lubricant pipelines, etc., should also be examined. If difficulties arise in describing, in the report, one or another element of a given mechanism, the investigator should request assistance from the necessary specialist.

The examination of the victim's work place should include an indication of its condition and dimensions, the placement of machinery, raw materials, stockpiles of finished parts and other objects, including those which have no connection to the job in question. The instruments which the victim was using are examined, traces of mechanical, chemical or thermal impact are described in detail, as well as any bloodstains or other traces found during the examination.

If the corpse of the victim is discovered during the examination, the following should be recorded: its position and placement relative to machinery and other objects on the site, any injury visible on the corpse (its location and nature), the victim's clothing and footwear (its condition and any marks or damage to it) and the presence of individual safety equipment. The examination of the latter should indicate its condition, whether or not it is complete and in good repair, and whether or not its dimensions correctly correspond to the physical dimensions of the victim.

During the examination, the investigator may suggest that the specialists record the temperatures of the surrounding areas, the lighting, humidity, noise levels or that they take the necessary samples and do preliminary analysis for the presence of any noxious fumes, chemical compounds or gases. As real evidence to be included in the case and submitted for expert analysis, the following should be removed from the site: damaged parts of any machinery or mechanism, wires showing evidence of short circuiting, defective control and measurement instruments, individual protective devices as well as any tools if they have been discovered to contain evidence relating to the accident or indicating that they were used in a way contradictory to job safety regulations.

In terms of the given category of criminal offence, and keeping in mind the site of the accident and those difficulties connected with recording the location and any evidence discovered therein, forensic photography may be necessary as a supplementary resource in recording the details and composing a diagram of the site. As far as the technical aspects of such a diagram are concerned, the investigator may invite the participation of design personnel or other individuals who have the necessary expertise.

In practice, there have been instances where, in the investigation of crimes of this category, the investigator has declined to conduct an examination of the site for the reason that a similar examination had been performed earlier by the union technical inspector involved in the internal investigation of the accident. Such an examination may prove helpful in clearing up the causes and circumstances of the accident. But it may not, however, be a substitute for the investigative examination. In the first place, an internal examination usually has not a procedural character. Secondly, the individuals conducting the examination usually lack the necessary experience and are not familiar with the tactics of the investigative examination. All of this has an effect on the results of the examination. And, finally, substituting a prior internal examination (which has different motives) for the investigator's own activity leads to a situation where a whole series of questions, important to the outcome of the investigative examination, remain unanswered.

Examining Documents. Together with an examination of the accident site, the investigator should remove and examine the following documents: (a) technical documentation relating to performance of one or another job; (b) documents relating to the condition of machinery; (c) documents describing the organisation of work; (d) documents indicating whether or not the victim and the suspect were given training in job safety and the degree of this training; and (e) documents which relate to safety conditions at the given plant.

The removal and inspection of documents are conducted with the aid of a specialist who helps the investigator choose the necessary documents and who, during the examination, may bring important facts contained therein to the investigator's attention.

In the examination of blueprints, descriptions of technological processes, production charts, official instructions and other similar materials, attention is paid not only to their contents, but to whether they have been authorised by the appropriate officials and duly coordinated with other relevant organisations. The examination of the repair schedules for machinery should show the deadlines recommended and the nature of the repair work. If the documents in question indicate any activity on the part of an official in fulfilling his responsibilities (for example, the log-books for a mechanism, the registration books for instruction in job safety), careful analysis is made of the contents of the notations contained therein in order to check their completeness, the presence of any dates and the signatures of the corresponding individuals. When examining permits and licences granting the right to operate a given mechanism or perform a certain job, or certifying the completion of a job safety course, the completeness of these documents is checked and attention is paid to the period of their validity. When doubt arises as to the authenticity of entries in such documentation, the latter should be compared with other documentation which contains the same or similar data. If necessary, the documents may be subjected to preliminary analysis to the extent that the investigator's technical means allow.

Expert Examination. If, as a result of an accident a worker is killed or suffers serious physical injury, the investigator requests *forensic-medical expert examination* to determine the cause of death, the time of death or the nature and gravity the physical injury. Depending on the particular circumstances of the accident, the expert may also be requested to determine if the victim was in an inebriated or drug-induced state at the time of the accident; if he had any medical limitations which should have prevented him from performing a given job; whether the physical injury could be a result of the circumstances as described by the victim; and, finally, what the degree of the loss of ability to work is.

In order to answer many important questions in the investigation, specialised knowledge of the area of job safety is needed. It is often necessary to request *forensic-technical expert examination*. As a rule, it is designed to answer the following questions: what were the reasons for the accident; were job safety (or other) regulations violated; what was the nature of these violations; who was responsible for observing job safety rules; were there, from a technical point of view, connections between these violations and the resulting accident? If criminal charges have been brought on the basis of violations of job safety regulations, the expert may be asked to decide as to the possible results of the given violations. Other questions may be put to him as well, depending on the specific nature of the accident (for example, questions dealing with the nature of the event; about the correspondence between technical processes, manufacturing operations or individual jobs and the rules of job safety; about conditions which could have facilitated the commission of the crime) and if specialised knowledge is deemed necessary to answer them.

Insofar as the report submitted by the union technical inspector contains factual data pertaining to the accident in question, analyses its causes and identifies individuals responsible for job safety, and gives other information relating to the area of forensic-technical examination, doubt may arise as to the necessity of expert examination in those cases when the report gives sufficiently complete answers to the investigator's questions.

Employees of scientific research institutes, instructors from corresponding higher educational institutes, highly-qualified specialists, including safety engineers, are among those individuals who may be invited as experts in an investigation. Union technical inspectors may be invited only in those cases which deal with crimes committed on sites not under their jurisdiction.

Other forms of expert examination may also be conducted in cases dealing with criminal violation of job safety regulations. For example, to uncover forged documents and to identify the individual responsible for a given entry or forged signature, technical-criminalistic examination of the documents and handwriting analysis are used to determine the guilty party. An expert in the study of metals is consulted to determine the manner and technical causes of damage to parts and assembly. Forensic study of traces is needed to determine the manner in which a given trace was made, and to identify tools (for example, those used by the victim).

Investigative experiment during inquiry into criminal violations of job safety regulations should be conducted with a maximum of caution, as the accident conditions recreated in the course of the investigatory activity may be hazardous to the health and well-being of those involved in the inquiry. Such experimentation often gives valuable results. For example, investigative experiments make it possible to hear warning signals near machinery in operation, to witness the actions of one or another employee from a given vantage point on the site (from the control room, for example), to perform a given activity under specific conditions (for example, to do a specific job while using individual protective devices issued to workers in the given enterprise).

Interrogation. As preparation for interrogation the investigator, in addition to fulfilling the usual requirements and studying the materials available to him, should familiarise himself with those documents which indicate the state of job safety measures on the site, and the specifics of the technological process performed on the site where the victim was working. He should also study the corresponding instructions on job safety on the site and consult with specialists on technical or manufacturing questions which relate to his investigation. On the basis of all this, a plan of interrogation is formulated, specific questions to be answered are indicated, evidence and documents which will be used in the course of the investigation are identified. Preparation for interrogation of the suspect, who, as a specialist in the given field can competently answer any specific question, is extremely important. An investigator who is unprepared will find it difficult to conduct the interrogation.

Interrogation of the victim, as a rule, answers questions which are relative to his work profile, the circumstances of the accident and its causes. Specifically, the interrogation is concerned with: the individual's level of professional training, his seniority in his field, his knowledge of job safety regulations and the date of his last instruction in job safety. The interrogation also establishes during what job, on what kind of machinery and what tools were in use when the accident occurred; who assigned the victim to that job; was he trained for that job; did the job correspond to his speciality and qualifications; was he trained on that job; did he have his own safety equipment and was he using it; was anyone supervising him; and what, in his own opinion, were the causes of the accident? Other questions may be posed if needed. In interrogating an accident victim it is important to keep in mind, that due to the effects of the accident conditions, the victim is not always able to give detailed evidence, and sometimes may unintentionally distort certain details.

Interrogation of witnesses elucidates the circumstances of the accident as well as actions on the part of the victim and other individuals immediately preceding the accident. Usually, witnesses were involved in their own jobs at the time immediately before the accident and, consequently, their impressions of the circumstances surrounding the event are of a fragmentary nature. For example, in an instance where a load fell from the boom of a crane, witnesses may be able to say that they heard the victim's shout, and the noise from the falling load, and they may also be able to indicate where the load fell, what the condition of the victim was and what first-aid he was given. But rarely these witnesses will be able to give more than scant information as to the victim's actions immediately before the accident, about the way in which the load was fastened, how the hoist was working, etc. Therefore, the investigator should make every effort to secure testimony from all witnesses in order to get the most complete information about the circumstances surrounding the accident.

The following individuals should be questioned as witnesses: the victim's fellow workers, the crew chief, the foreman, the shop manager, the safety engineer, representatives of the management and the enterprise's technical-engineering personnel, the union technical inspector and the victim's relatives.

Questioning the victim's fellow workers, as a rule, helps to answer questions dealing with the organisation of work, with the condition of job safety on the given site and the circumstances of the accident.

In those situations where the event under investigation is the subject of constant conversation among the workers, it is possible that one or another individual, as a result, may give testimony which is a mixture of fact (those facts which he witnessed firsthand) and fiction (information, often distorted, which he has heard from others during their discussion of the accident). It is also not uncommon to see situations where criminal violation of job safety regulations is under investigation, in which individuals being questioned (depending on their positions and relation to the accident) occupy diametrically opposed positions. Some of these, in their testimony, vindicate the guilty parties in their actions by saying that these violations of job safety were a necessary condition of completing the manufacture and fulfilling the plan. These individuals accuse the victim himself of negligence and carelessness. Others will unconditionally consider those officials (responsible for job safety) the guilty parties. The investigator is able to establish the real nature of events in such situations only through the maximum concretisation of testimony, formulation of questions which define and control, the presentation of real evidence, photographs, diagrams and sketches of the accident site, and any necessary documentation. If necessary, the interrogation may be conducted on the accident site which may, in certain instances, give more full and authentic evidence.

Interrogation of the suspect is intended to answer questions relating to his professional activity, his professional training (including that in job safety), the condition of safety measures on the site under his jurisdiction and the circumstances surrounding the accident.

It is rare occurrence that the suspect will claim, as an indication of his innocence, that he was unfamiliar with his responsibilities or the rules of job safety. Usually, in his own defense, the suspect will refer to the necessity of fulfilling a plan, or to an intentional action or simple carelessness on the part of the victim. One way of getting to the truth of his testimony is to expose him using the testimony of witnesses, documentation and real evidence uncovered on the accident site. If the suspect introduces facts or cites specific circumstances which prevented him from supervising the observance of safety regulations on the site, the investigator must carefully verify those circumstances.

CHAPTER XXIX

INVESTIGATING THEFT, ROBBERY AND MUGGING

1. Criminalistic Characteristics of Crimes Involving State, Public and Private Property

Theft and robbery are mercenary crimes which result in the dispossession of state, public or personal property. Despite the fact that the objects of such crimes are often varied, the methods of their commission are, in general, identical. This, in turn, explains the similarities in their investigation.

Theft, in terms of its commission, is the secret stealing of property. The circumstances of such an action condition the time in which the crime is committed. Thefts from apartments or houses, from unguarded locations or from premises where people are temporarily absent (cloakrooms, offices, hotels) are usually committed during normal working hours, in the morning or daytime. Thefts from stores, warehouses, etc., on the other hand, take place during the evening or at night. Thefts may occur at train stations, on trains, in hotels and stores, and are differentiated accordingly.

Depending on the manner in which objects are removed, thefts are divided into those which involve property temporarily unattended and easily available and those involving property not easily available (theft from a closed location). With this in mind, corresponding methods and tools for committing the crime are chosen.

Depending on the specific circumstances of each theft, locks and other locking devices are broken, as well as windows, doors, walls, ceilings and floors. Often, common household tools and objects (such as crowbars, screwdrivers, tongs, etc.) are used to break into locked areas. Specially fitted keys and skeleton-keys are also used. Secret entry into a given premise in some instances is not accompanied by force when the area is found to be open, or when the criminal is able to use the victim's keys. In the majority of cases the thief steals clothing or money.

Burglaries are usually committed by repeat offenders, sometimes by more than one criminal. Often they are premeditated. Often examination of the scene of the crime will yield the tools used in the forcible entry, the criminal's hand- and footprints, tracks from motor vehicles used in the crime and any other objects inadvertently left behind.

Inquiry into thefts and robberies has its own particular characteristics conditioned, to a significant degree, by the circumstances of these crimes. In group crimes, the criminals act in a definite way, each of them fulfilling their own role. The attack may be preceded by preparation, during which time the criminals obtain weapons, work out a plan of action, fix the time and place of the attack, assign roles, map out the safest escape routes and prepare the means for a quick get-away and a hiding place for the stolen goods. Suddenness and speed are characteristic of such attacks. Keeping in mind that, in the vast majority of instances, the crimes take place under the cover of darkness, the victim is not always able to observe and remember the criminals' appearance. Often thieves will make attempts to alter their appearance (for example, they may wear dark glasses, cover a portion of their faces with a scarf, put on different clothing, etc). Insofar as these crimes often take place in uncrowded areas, during the dark hours of the day, there are usually no witnesses, and rarely will anyone be able to give any details of the attackers. Criminals who attack with force make use of their own physical strength, firearms or knives, various objects and even free-flowing substances such as sand or tobacco to prevent the victim from clearly seeing and recalling the attacker's features.

2. Investigatory Theories and Planning the Inquiry

Depending on the specific circumstances of theft from an enterprise or organisation, the following are considered possible theories: the theft was committed by persons outside the organisation or enterprise, with the help of insiders; it was committed by individuals charged with guarding the given site, or by outsiders with the help of officials. A theory which suggests that the forcible entry and theft was staged by an official in order to cover-up a shortage is also possible.

When formulating theories as to the individuals involved in the theft, it is important to keep in mind the manner in which the theft was committed, what was stolen and in what quantities, as well as information from examination of traces and other real evidence.

As concerns crimes of theft of personal property, the following explanations are possible: the theft actually occurred; the theft in reality did not occur and the complaint was filed due to some confusion on the part of the would-be victim; the theft was staged by the victim.

In order to uncover the guilty parties, it is imperative that all data from the initial investigatory activity be carefully studied. It is equally important to study traces and objects inadvertently left behind by the criminals; to determine the ways and means of entry onto the scene; to identify the tools used for forcible entry; to evaluate the criminals' possible knowledge as to the location of the most valuable items; to study any facts which suggest a crime was staged (specifically negative circumstances) and information provided by any witnesses.

In formulating theories as to the nature of a theft or robbery and the identity of those individuals who participated in them, the investigator should carefully analyse the results from the preliminary investigation and the operative-search procedures as well.

In those instances where the victim claims that the property stolen from him was not his own, and if, in the process of inquiry certain inconsistencies in his story arise in relation to the facts surrounding the case, it is possible to suggest a theory which suggests that the victim staged the crime himself. Usually those individuals who have either appropriated (for themselves) or lost property or important documents and arms entrusted to their care would attempt to stage a robbery or mugging. By attempting to pose as victims of a robbery committed by completely unknown individuals, these people, in this way seek to avoid any responsibility. Often in such staged crimes, other individuals (in addition to the "victim") will take part (friends, relatives, accomplices).

When suggesting theories as to the identity of individuals who have committed an attack, information is used which is the result of preliminary inquiry (where the crime took place, the number of criminals, their appearance, their actions at the time of the attack, traces and objects found on the scene, etc).

The investigator should verify these theories while working closely with operatives by conducting an entire complex of investigatory and search measures.

3. The Particulars of Investigating a Theft

Examining the Scene of the Crime. After receiving information about a theft, it is imperative that the scene be examined immediately and any witnesses be questioned. If the theft was committed in an enterprise or organisation, an inventory should be immediately ordered.

Before beginning the examination, the investigator should find out from the officials in charge where money and important documents were usually kept.

When examining the scene of a forcible entry, the investigator should find out from the victim what the relationship is between traces and objects found on the scene and the crime itself. It is imperative to carefully study the conditions of the crime scene, especially the location and condition of the storage area from which the property was stolen, and any access to it. The placement of guard posts should be noted, as well as the presence and condition of security and alarm devices and ways in which the criminal entered and left the scene. Adjoining locations such as courtyards and stairways should be examined as well. Other areas important to the investigation are those places where the criminal forced his way onto locked premiises, any area of damage to fences or locking devices, and the location from which valuables and other articles were removed.

In terms of traces left on the scene of a theft, those found most often are footprints, tracks left by vehicles, objects stolen and then abandoned, tools used in the forcible entry and any handprints they might contain.

In examining the point of forcible entry, it is recommended that the investigator consult with a specialist about the following: what tool was used in the forcible entry, when and during what time did the action occur, was the criminal fairly experienced, did he know the specifics of the given locking device, how many accopmlices took part in the action, how was the entry accomplished and could any particles resulting from this action have adhered to the criminal's clothing, footwear or body, or to the tool itself? If such particles are found, they should be removed and submitted for examination.

When describing the traces found on the scene as well as the instruments used in the entry in the investigatory report, the following must be indicated: the name of the object on which the traces were found, the type of traces (from a saw cut, slicing or pressure), the dimensions, placement and characteristics of the trace, as well as any foreign substances on it, identification of the instrument used in the forcible entry, its shape, size and any identifying marks, as well as the material from which it was made.

When examining the premises from which items have been stolen, it is important to determine: (a) what traces and objects were left by the criminal during the theft; (b) what was stolen; (c) how long the criminal was on the scene; (d) whether he knew of the existence and location of valuable items; (e) what traces from the crime scene could have remained on the criminal's clothing, footwear and body, as well as on tools and vehicles used.

When examining the scene of the crime, attention should be paid to negative circumstances which could indicate a staged theft. Such circumstances include: the presence of traces which show that a barrier has been broken from the inside, or the location of a point of forcible entry in a place not accessible from the outside, the absence of an indication of forcible entry or other traces which should be present under the given conditions, the presence of damage which could prevent actions supposedly committed by the criminal from occurring (for example, a hole whose dimensions would not allow the passage of a given object).

Interrogating Witnesses. After the scene has been examined, victims and witnesses (if the theft occurred in a private residence) as well as individuals who work in the organisation, enterprise or institution where the theft took place, should be questioned. Among the latter, it is important to question guards as well as those individuals who first discovered the crime.

In questioning the aforementioned individuals, it is important, insofar as it is possible, to answer the following questions: when, and under what circumstances was the theft first discovered; what was stolen (names of items, quantities, value, characteristics); where were the stolen goods stored; how was the area closed off and who had keys to it; who was noticed on the scene by the individual being questioned; were any noises heard at that time (blows, crashes, squeaks, the sounds of a car engine, etc.); who does the individual being questioned suspect of committing the theft, and what are the grounds for this suspicion?

When *questioning the victim and any officials in charge*, special attention should be paid to getting information about the stolen property and the latter should be described (individual characteristics) in detail. It should also be established when the official in charge last took inventory of his stocks and what were the results of that inventory. It is a good idea to remove the entries made during that inventory which will give a more precise description of the kinds and quantities of goods stolen. If the theft took place immediately after a large sum of money or a new shipment of goods were received, it is important to determine who, in addition to the employees of the given enterprise, knew about this. Finally, it should be established whether or not there had been prior thefts (successful, or only attempted) at the given location.

When questioning a watchman assigned to guard the given site and other possible witnesses who live near the site of the theft, it should be determined whether or not they saw any unauthorised individuals near the scene. They should be questioned as to the individuals' appearance and whether or not they attempted to divert the witnesses attention or give any kind of signals.

In certain cases an investigative experiment is conducted as part of the early stages of the investigation (for example, an experiment to verify the possibility of removing an object similar to the one stolen—according to the description given by the official in charge—through an opening). If there is sufficient reason to suspect that either the official or the watchman participated in the theft, they are searched as part of the investigation as well. Those traces found on the scene are submitted to forensic-expert examination in order to determine their nature and formation.

Operative-Search Procedures. Depending on the specific circumstances of the given crime, and keeping in mind the data obtained from an examination of the scene and from the interrogation of the victim and witnesses, operative-search procedures may be conducted, including those which entail following hot pursuit, using search dogs (prior to beginning an examination at the scene), positioning checkpoints at locations along the criminal's possible escape route, identifying individuals who buy stolen goods (fences), staking out locations where stolen goods may be kept or sold (at marketplaces, in pawn shops and buying points, baggage storage areas at airports and train stations) in order to detain those individuals who are either selling stolen goods or storing them, and informing the law-enforcement agencies and other officials along the criminal's possible escape routes.

In pawn shops and buying points as well as at baggage storage areas, it is possible to monitor the receipt of luggage and other objects using claim checks. If the search gives positive results, it is imperative to question the employee who either bought or took in the item in question, and obtain information as to the appearance of the "owner" of the object. The claim check should be confiscated as it will contain the signature of the "owner". In addition, the employees of the given establishment should be given a description and any identification numbers of the stolen goods so that they will be able to identify the objects and notify the authorities.

In attempting to solve thefts, the resources of criminal registries are used as fully as possible (inventories of stolen goods, lists of crimes catalogued according to the ways in which they were committed, etc).

4. The Specifics of Inquiry into Thefts and Muggings

After having received information about a theft or mugging necessary measures should be immediately taken in an effort to capture the criminals. In addition to taking these measures, it is wise to immediately interrogate the individual filing the complaint (this is usually the victim himself or a witness to the attack) and to examine the scene of the theft or mugging.

The fullest information about the attack is usually obtained by *interrogating the victim*. It is necessary to establish: where, when and under what circumstances the attack took place; who was the victim; what was stolen and the worth of the stolen goods; how many attackers were there and how were they armed; was force used on the victim and, if so, what was the nature of the force and was it life-threatening; did the victim suffer any bodily injury or was his clothing damaged at all? If the attackers confined themselves to threats of force, the nature of these should be established: was the victim threatened with death or simply with serious bodily harm? It is important to establish the features of each of the attackers (age, sex, height, build, particular features, peculiarities of gait, speech, etc.) and the details of their clothing. When interrogating the victim in an attempt to obtain a description of the attackers, it is important to establish not only the conditions under which the victim saw the attackers (at what distance, in what kind of light, for how long), but his own condition at the moment of the attack (fear, extreme agitation) and the keenness of his sight and hearing. If possible the following should be determined: how the attackers referred to each other and what they talked about amongst themselves and with the victim; what was each attacker's role; in what direction did they make their escape; did they use a vehicle, and if so, what make was it; what traces and objects could the attackers have left behind on the scene and, finally, who could have witnessed the attack?

During questioning, it is important to establish: data as to the characteristics of the stolen goods and their packaging, as well as those individuals who might be able to give this information; whether or not the victim has any items similar to those which were stolen or parts from the latter; does the victim have any photographs of the stolen goods? If watches, cameras or other objects such as documents which have individual identification numbers were stolen, the victim should be questioned to see if he remembers the numbers, or if he has any documentation establishing his ownership of the items in question.

It is also important to establish where and with whom the victim was in the period immediately preceding the attack, was he alone or with friends; what state was he in? In addition to this the interrogation should attempt to determine how the victim conducted himself during the attack: did he yell, call for help, attempt to run away, did he offer any resistance, and if so, what was the nature of the resistance and what traces could it have left on the attacker's clothing or body (rips in clothing, abrasions, scratches, cuts, bite marks, etc)?

Similar questions should be put to any witnesses as well.

If the victim suffered bodily injury in the attack, he should receive medical aid first and only then, with permission from the doctor, should he be questioned. If the victim is in serious condition, the interrogation should be limited to questions about the circumstances of the attack, the appearance of the attackers and a description of the stolen goods. The interrogation should be tape-recorded.

The scene of the crime should be examined in all cases, regardless of the location of the attack, be it in an enclosed premises or in an open location.

During examination, attention should be paid to any traces left by the attackers, either on the scene itself, or in the area surrounding it (foot- and fingerprints, traces left by vehicles, bloodstrains, traces from firearms, etc.), and to any objects thrown away or dropped accidentally by the attackers (a weapon, hats, buttons, etc).

It is important to verify circumstances which contradict the story given by the individual filing the complaits and which are characteristic of staged thefts and muggings (the absence of traces from "attackers", no evidence of a struggle, etc).

Besides interrogating the victims and witnesses, and examining the scene of the crime, an examination of the victim's clothing and a medical examination of the victim himself may also be included in the initial stages of investigatory activity dealing with thefts and muggings. These actions become mandatory in those instances when, according to the victim's complaint, he was injured (bodily, or damage was done to his clothing) during the attack.

Operative-Search Procedures. In addition to initial investigative activities, operative-search procedures should be initiated aimed at capturing the thief and recovering the stolen property. Depending on the specific circumstances of the given crime, and on the information received from the initial investigative activity, these search procedures may be hot pursuit with the participation of either the victim or a witness who might recall the appearance of the attackers, or the use of search dogs, or cordoning off the area around the scene of the attack, with the intent to capture the criminals.

Having identified the individual suspected of committing the attack, he should be arrested immediately and searched for weapons and the stolen property. His clothing should be carefully examined for traces and damage.

If, judging by the circumstances of the case, there is reason to assume that the suspect may have sustained bodily injury, he should be examined immediately.

After apprehending the suspect, it is imperative to conduct a series of investigative actions designed to obtain information and evidence which will either prove or disprove the suspect's guilt in the given case. In addition to these actions, the investigator should take steps to locate the stolen property and identify any accomplices, and to compensate the victim for the damage inflicted by the crime. In order to do this, the investigator must search the suspect's residence for stolen goods and valuables and present any goods found, as well as the suspect, to the victim for identification.

During *interrogation of the suspect (the accused)*, the following should be established: where he was and what he was doing during the time of the alleged crime, and before and after as well, up to the time of his arrest; who might be able to corroborate his story; where, when, how and under what circumstances did he acquire those objects confiscated during the search.

The suspect's evidence (especially in those cases where he refers to his own alibi) must be carefully verified by interrogating witnesses, conducting confrontations, requesting forensic-medical and criminalistic expert examination and conducting investigative experiments which verify evidence *in situ*.

Forensic Expert Examination. Using forensic expert examination makes it possible to determine substantial circumstances by studying bodily injury inflicted on either the suspect or the victim, as well as traces found on the scene of the crime or confiscated from the suspect.

Forensic-medical examination is recommended in those instances where either the victim or the suspect has suffered bodily injury. The forensic-medical examiner may be able to determine their nature, the degree of the injury, how long ago the injury was inflicted, how it was inflicted, the type of weapon used, and to indicate the victim's position when he was wounded. In order to establish the conditions under which the injury occurred, it may be necessary to order complex forensic-medical and criminalistic expert examination. This involves examining wounds, damage to clothing, weapons and other instruments, traces from shots and other traces as well. Electrography may reveal invisible traces from metallisation which remain on the clothing of the victim, or on his body, and which give the possibility of identifying the metal from which the given weapon was made.

Criminalistic expert examination of microscopic traces and particles, organic as well as inorganic in nature, which have been found on the suspect's clothing or body, helps in assigning them to a particular location. The expert may then conclude that these foreign substances found on the suspect or on objects seized from him are a result of direct contact with the victim.

Exposing Staged Attacks. When verifying a theory about a staged robbery or mugging the investigator must compare the facts given by the individual filing the complaint (the declarant), with those obtained from initial investigative activity. He must verify the victim's testimony that he really did have valuables which, in his words, were stolen during an attack and, using forensic-medical expert examination, verify testimony that the declarant suffered bodily injury. Using criminalistic expert examination, the investigator must verify the account of damage to the declarant's clothing and corresponding injury to his body. The investigator must establish the declarant's lifestyle and behavior before and after the attack. If there is evidence enough to support such action, a search of the declarant's home and workplace must be performed in order to uncover objects reported as stolen. Using investigation experiment and verification of evidence on the scene, the investigator must verify the truthfulness of the declarant's testimony which relates to the circumstances and conditions of the attack. It should always be kept in mind, that an account dealing with a staged robbery or mugging must be carefully verified so that the victim of an actual crime should not be accused of staging one.

CHAPTER XXX

THE INVESTIGATION OF MALFEASANCES

1. The Criminalistic Description of Malfeasances

Malfeasances committed by public servants are contrary to the interests of the service, and are in essence illegal actions (or inaction) involving an abuse of public office, and/or which are a cause of harm either to the interests of society and the state, or to individual rights and interests protected by the law. They are the criminal failure to carry out one's duties, or an inappropriate execution thereof; they are an abuse of power or of public office; they are the excessive use of power and/or public authority, or they may be the taking of bribes and the forgery. Almost all the crimes committed by public servants involve a double guilt: there is the intention to carry out a certain act, and negligence as to the consequences. Such an intention is characterised by the presence of mercenary or other personal motives.

All malfeasances are characterised by illegal activity (or inaction) resulting in substantial harm, and there is a cause link between the two activities.

The most important element of a criminalistic description of malfeasances is information concerning the following: the ways and means by which the crime was committed, the circumstances which facilitated the execution thereof, and the links between the crime in question and other criminal activities.

First of all, it is necessary to acknowledge that there are numerous ways in which public servants may break the law. Experience suggests that in those instances when the crime is committed either by wilful illegal activity, by violations of set rules, and/or by disobedience of rules and instructions, the following methods are used:

— the intentional use of incorrect entries in official documentation;

— the printing of illegal orders and instructions;

— the concealment of the illegal activity of others by wilfully carrying out other illegal acts;

— the temporary borrowing and use of state or public property for personal use;

— the unauthorised distribution of monies;

— the ussuance of false invoices:

— the correction, etching and introduction of other changes to the texts of official documentation;

— the illegal use of arms by those in authority; and finally,

— the beating of subordinates.

In cases of inaction the infringement of the law by public servants takes, generally, such forms as criminally careless management of property entrusted to them, careless performance of their duties and regulations, creating situations which rule out effective control and supervision, etc. The illegal activities (or inaction) of a public servant will invariably leave behind consequences and traces in written documents, invoices, statements of account, orders on the issue of illegal awards, and so on. The identification of such traces helps the investigator to correctly formulate the nature of the committed offences, to establish where and when and by what means such crimes were committed, and to identify those witnesses who might be able to report important information about the case.

A criminalistic analysis of the motives of committing occupational crimes tends to indicate that the most widespread ones are the following: mercenary greed, personal interests, envy, revenge, a desire to create an image of work well done, and a false understanding of the requirements of the service.

An important element of the criminalistic description of the crimes in question is the accumulation of information about the typical links between these and other crimes. A public servant's failure to fulfil his responsibilities often forms a basis favourable for committing other crimes, such as the misappropriation of property, upward plan distortions or the dispatch of poor-quality goods. The following defaults in the performance of one's public duties may indicate a link to crimes of misappropriation:

— unregistered corrections in documents of transfer or acceptance of merchandise, in writing off morally obsolescent products or those beyond repair;

— documental forgeries;

— changes in the grading of goods;

— untimely entries in the accounts of material valuables;

— fictitious operations with merchandise;

— large quantities of reject goods;

— the untimely presentation and/or improper formulation of the accounts on the transfer of valuable goods; and lastly,

— infringements of the technical criteria laid down for the production of certain manufactured articles, and so on.

2. Theories of the Crime and Planning an Investigation

The detection of malfeasances is always complicated, because the criminals often resort to various subterfuges in order to cover up their activities (or their failures to act, as the case may be) with a number of objective reasons which are used to conceal the crime. It is often rather difficult in an investigation of malfeasances to determine the limits between what may be an infringement of administrative law, and that which is a crime.

The following are the most common grounds for initiating proceedings in a case of malfeasances:

— the inventory and audit reports of the financial management of the enterprises, administration offices and/or organisations concerned;

— information as to a deficit of valuable goods and/or financial resources:

— statements of individual citizens;

— letters, notes and articles published in the press;

— information received as a result of an operational search, and so on.

In order to get objective and complete information as to whether or not such a crime has been committed, the investigator must verify all these items of real evidence thoroughly. If in the material submitted there are insufficient data as to the symptoms of a crime, then the investigator should insist on supplementary information, so as to confirm certain facts. Such might be obtained via measurement of the volume of work actually completed in the enterprise, via the initiation of an audit, a verification of the financial and other economic management involved, or by an explanation from the relevant public servant.

In certain instances, inspectors should be given the task of bringing to light certain facts, for example, by seizing the suspects red-handed, and by taking other measures. Wasting time in this regard may lead to a loss of information and material traces, to the destruction of documentation, to the concealment of valuable items and illegally acquired profits, and to the destruction of and/or alterations to traces of the crime.

The initial task of the investigation is to establish that the accused is a public servant. The investigation starts with the promotion of various theories of the crime, such theory concerning the relatively unclear and doubtful circumstances. Determining these facts in detail helps both the complete disclosure of crimes and their perpetrators.

If the investigator has at his disposal information about the subject of occupational crime and about his criminal actions (or inaction), then will the former suggest a theory of the crime as to the form of guilt involved and the motives of the crime. If only the consequences of a criminal action (or inaction) are known — such as, for instance, when there is damage to property — the investigator will initiate theories as to (a) what caused these consequences, (b) which people were involved and (c) what was the nature of the criminal actions (or inaction) which then wrought such damage and destruction. He will also suggest various theories as to the links between the crime of the public servant and other crimes (misappropriations, and so on). During the verification of these theories, the investigator establishes the causation between the actions (or inaction) of the public servants, and the harmful consequences which followed. In addition, he attempts to identify the guilt of each of the accused, and to find out what were the circumstances of the crime which facilitated the execution thereof.

In order to verify the enumerated theories of the crime, the investigator should work out a comprehensive plan for the investigation. This should include the following: preparatory organisational measures to guarantee the successful conduct of the various investigatory activities to be undertaken; an audit; the selection of specialists; a verification of the identities of those under suspicion; and lastly, a familiarisation with the production and structure of the enterprise, and with the disposition of the different workshops and production centres.

To a large extent, the success of an investigation into such crimes depends on a strict definition of the circle of circumstances which need to be established.

In cases of abuse of power and public office, the following should be identified:

— who committed the crime, and in what way he abused his public office or the power entrusted to him;

— the means by which the crime was committed, and what were the motives involved;

— what damage was done, whether or not the crime was premeditated and whether or not the abuse of power was linked with the crime of misappropriation, bribe-taking, etc.;

— whether or not the crime took place in one or several enterprises (administration offices, organisations), and what loss was involved; and finally,

— whether or not there is a causation linking the actions (or inaction) of the public servant with the destructive consequences thereof.

Approximately the same set of circumstances apply to cases of the excessive use of power and/or authority.

In cases of criminal negligence or the improper performance of duties, the investigator should find out:

— what damage was done, and what losses were incurred;

— what forms of guilt are involved;

— whether or not there is a causation between the actions (or inaction) for the public servant and the harmful consequences which followed;

— whether or not such destructive consequences could have been avoided; and lastly,

— specific reasons for which the public servant concerned did not carry out his duties.

In cases of bribe-taking — and this involves the giving and taking of bribes, and acting as an intermediary — the following facts should be established and the following questions answered:

— the facts of both the receipt and issue of bribes;

— the nature of the public servant's actions undertaken as a compensation for the receipt of a bribe;

— the character of the mutual relationships between the accomplices in the crime;

— by whom, through whom and to whom the bribes were handled;

— what objects were bribed; how and in what circumstances they were obtained;

— when and where bribes were made;

— whether or not the bribes were extorted, what was the purpose of the bribes, and whether or not they were linked with other crimes (like forgery by public servants, stealing public property, etc.); and

— what was the nature and the measure of the damage.

And finally, in cases of forgery:

— what type of forgery was involved, whether it was intellectual or material, and in what form it was manifest;

— by what means the forgery was executed;

— whether the documents in question were official ones;

— whether or not it has been established that the public servant abused his public office in perpetrating this crime;

— what forms of guilt were involved, and what were the motives for the crime; and lastly,

— if there are any links with any other crimes — misappropriations, the production of poor-quality goods, and so on.

In the above cases of malfeasances, the nature and sequence of investigatory activities planned in their initial stage to a certain degree depend on the investigatory situation prevailed and on the criminalistic characteristics of the crime concerned.

The following are the most typical and general investigatory activities: seizing and examining the documents, interrogating the witnesses, and searching and examining the scene of the crime.

At the initial stage of the investigation, the investigator may wish to carry out an audit or initiate various expert examinations to look into the bookkeeping, production and economy of the enterprise. A criminalistic examination can also be initiated. And a part of an operative-search measure on a number of instances is the arrest, red-handed, of the suspect.

Documentation directly linked with the execution of the crime is often a prime source of proof. The examination and use of the contents thereof help the identification and exposure of the public servants involved, and assist the disclosure of the harmful consequences. In order to exclude the possibility of certain persons becoming aware of what is going on, and of falsifying or destroying the documentation, it is both tactical and expedient to carry out an examination of such documents in the immediate vicinity, i. e., in the organisation or administrative office where the suspects work. The inclusion of expert economists, technologists and commodity experts is, of course, recommended.

3. The Specific Characteristics of an Investigation into the Abuse of Power and Public Office, and into Criminal Inaction

The abuse of power or public office is always linked with the guilty party using his public office contrary to the interests of the service. Motivated by profit or some other personal interest, the public servant brings harm to the interests of the state and of society, or indeed to the maintenance of everyone's rights. The crimes here considered are multifarious in both form and content, but they usually involve the deception of controlling organs, infringements of financial discipline, undue maintenance of property, infringements of trading laws, etc. In the majority of cases, the abuse of power falls into one of the following categories:

— actions which have not been necessitated by the requirements of the service but which have nevertheless been carried out within the parameters of the public servant's authority (for example, the transfer of an unpleasant individual to lesser-paid work);

— actions which are obviously in excess of the rights of the public servant concerned (i. e., the construction of a private home with the resources of the enterprise, etc.); and

— inaction.

In the instances of abuse of power or public office, the majority of cases are initiated in accordance with information received from the auditing organs or that from the corresponding departments. If the indications of the crime are clearly marked in the documents which were used as grounds for the institution of proceedings, and if such indications were displayed in the documents submitted, then the investigation usually starts with an interrogation of the public servant suspected of the crime. In the majority of cases, however, such abuses are not so clearly reflected in the documents submitted. This is why, before criminal proceedings are instituted, and before the investigation is initiated, the original submitted material must be analysed. Furthermore, the investigator must familiarise himself with the work of the organisation where the abuses were committed, study the rules and regulations which govern its everyday activities, look into the rights and responsibilities of the public servant concerned, and examine the parameters of the latter's authority, infringements of which are the subjects matter of the submissions. All this is especially helpful in outlining the circle of public servants who may have been party to the abuses of power; in addition, it assists both the identification and seizure of the documents which should be examined, and the formulation of questions for the auditors and experts.

If, in the course of an investigation, it becomes apparent that a certain public servant has repeatedly abused his authority, then it will be necessary first of all to identify the time at which each particular abuse was committed; this facilitates the marking out of the route for the search for evidence, and the outlining of the group of possible guilty persons. The examination of the scene of the crime, the inspection of the documents, and the conduct of expert examinations, all play an important role in identifying the time at which abuses took place.

As applied to these abuses, the scene of the crime is usually considered to be the place where their harmful consequences occur. The initial investigatory activities include the seizure and examination of any relevant documentation, an inspection of the scene of the crime, an interrogation of the witnesses and suspects, and sometimes a search of the public servant's home and place of work. An investigatory examination of the documentation helps the investigator to identify both any material traces of the crime (additions to figures and words, erasures and so on), and any possible intellectual forgery, i. e., a predetermined inclusion of false information into correctly compiled documents. The examination of these documents sometimes leads to the identification, either of material losses caused by the said abuses of power, or of other harmful consequences. The documentation is also necessary for drawing expert conclusions. Therefore, in trying to avoid the deliberate destruction or alteration of the documentation, the investigator will either immediately remove same, or he will create such security arrangements for their protection as will prevent anyone being allowed therein without the inspector's permission. If any particular document arouses his suspicions, it is removed and sent for an expert criminalistic examination.

In those instances when a specialist opinion is needed, so to identify the circumstances of the abuse of power, expert examinations are initiated. A technical one can establish the cause of an accident and the suitability of certain equipment for future use; a commodity examination can define the quality and variety of goods, and the correct forms of storage and transport for both manufactured products and processed foods; an examination of accounts can find out the financial procedures both in the enterprise at large, and in the entries of certain public servants in the corresponding documents, if it appears impossible to answer these questions in any other way, i. e., through an official audit; and lastly, a legal economic examination can establish whether or not the enterprise has made proper use of its financial resources, and find out the scale of damages and the loss of profits resulting from stopped production, and so on.

The evidence of witnesses is an effective way of exposing the abuse of power or public office. Depending on the content of such evidence obtained under interrogation, it is possible to divide these witnesses into a few groups.

The first one are those who first informed the relevant authorities as to the illegal activities of the public servants, and to their consequences (such people include those who conducted the inventory, the auditors, representatives of the administration, members of staff from the office of the auditors general, and so on). If the materials supplied by such persons served the basis on which criminal proceedings were initiated, then they will usually be questioned right at the beginning for they will be able to describe (a) the behaviour of the public servants involved, during the verification and the inventory; (b) the particular characteristics of the work of the enterprise; (c) the exact facts of the abuses of power, and (d) the inadequacies which facilitated such abuses. In addition, they will be able to explain the conclusions of the audit, to facilitate an understanding of the documents, and to define the scale of the damage caused.

The second group includes those who are well aware of the work of the accused. Such persons include those accountants and economists who are able, firstly, to establish the causes of material damage, secondly, to relate the details of the criminal activities of the public servant involved.

The third group of witnesses are those who know full well the particular circumstances of the public servant's abuses of power, and who have suffered from his unlawful activities. In questioning such persons, the investigator should seek a detailed explanation of all the circumstances of the criminal abuse of power, as well as of the motives and goals of the crime.

The fourth group are the superiors of the accused, and the management of the enterprise where he worked. They are able to explain when they became aware of the abuses in question, and which measures they took to prevent any harmful consequences. Furthermore, they can describe the general behaviour at work of the public servants involved.

During the investigation, the investigator will also question some of the acquaintances of the accused, those answerable for the abuses of power at work, (relatives and fellow civil servants). They are able to describe the public servant's lifestyle, how he obtained valuable materials in excess of his income, and how he managed to acquire illegal gains, etc.

In certain cases as are dictated by their own vested interests, some witnesses may be tempted to slander the suspects. That is why it is necessary, in every case, to try and find those documents wherein the investigator can confirm information about the activities of the public servant which were not in the interests of the service and which infringed upon the rights of the citizens at large. In addition, the investigator should endeavour to establish the exact source of all this information.

Criminal inaction is not regarded as a deliberate act. In this way, this particular crime differs from other forms of criminal activity committed in the public service. Such a case of criminal inaction is caused, either by the public servant's failure to carry out his duties in full or in part, or by his negligence in looking after property entrusted to him, the results of which facilitate its loss or misappropriation. The most widespread form of damage in this case is the loss of money, valuable trade goods and/or production.

More often than not, criminal proceedings are initiated on the basis of those auditors' reports which indicate the absence of certain goods and valuables.

Crimes of this type are usually characterised by careless accounting procedures, a failure to weigh valuable goods on receipt and dispatch, the access of outsiders to valuable goods, a failure to observe the rules for the storage and transport of goods, and a failure to fulfil the regulations concerning construction work, etc.

The initial investigatory activities include an examination of the scene of the crime, a review of the relevant documents, and an inspection of samples of the manufactured goods, raw materials and primary products involved in the enterprise, and a medical examination of those who have suffered as a consequence of the crime. The final aim of the investigation is the identification of both the actual responsibilities of the public servant concerned, and the extent of the infringements he has committed. To this aim, the investigator questions the witnesses, interrogates the suspect, and studies the relevant rules and regulations. If the public servant states that his carelessness is due to his inexperience, or if he refers to the requirements of the service or to the negligent behaviour of the victims, then the investigator should confirm and verify the latter's arguments by questioning the servant's superiors and other witnesses. Furthermore, he should acquaint himself with the particular circumstances of work in the organisation, consult with specialists, and initiate expert examinations depending on the nature of the consequences of the crime (such examinations may relate to building, veterinary matters, technology, medicine, accountancy, agronomy and so on).

4. The Particular Features of an Investigation into Bribery

The Criminalistic Description of Bribery. Bribery is usually linked with a civil servant using his public office for personal gain, and in the overwhelming number of cases, it is carried out secretly and without witnesses. In any bribery, there is a link between the participants which most accurately describes the situation: either it is a link between he who offers and he who takes the bribe; or less frequently, it is a link via an intermediary. For instance, for briberies in the retail/wholesale trades, there are particular links between he who takes the bribe and several intermediaries. The latter usually act independently, but sometimes there are contacts between them. On receiving his share, the intermediary is interested in maintaining secrecy, and it is usually he who acts as the agent of the person who initiates the bribery. This link, and the moment at which the valuables are transferred, are usually thoroughly concealed. Just in case they are caught red-handed, the bribe-takers usually prepare an explanation well in advance. There are various ways of concealing a bribe, either as a donation or as a mutual exchange of gifts, etc.

Briberies are not always manifest in a material form. However, in a number of instances involving the exchange of objects as bribes, traces and fingerprints of the participants in the crime can be found on the packaging materials, and sometimes other traces are also to be found (cash receipts, labels, tags, cash, valuables and personal notes of the criminals, etc.).

A criminalistic description of bribery contains information about the following typical situations in which such crimes are committed:

(a) bribery committed in the interests of he who offers the bribe and connected with the execution of other illegal actions (inactions);

(b) bribery offered and received either with or without intermediaries;

(c) bribes taken under extortion, and

(d) bribes taken without extortion.

Planning the Investigation. Criminal proceedings are instituted in accordance with information received from any of the following sources: community representatives, civil servants, a member of the public, publications in the press, and/or an operative-search official report. In resolving the question of whether or not to initiate proceedings, the investigator evaluates the initial information and the investigatory situation formed; on this basis, he can work out certain theories of the crime, and plan the future investigation.

In cases of bribery, the following investigatory situations are rather typical:

A. When there is definite information about a civil servant being in receipt of bribes. In such instances, criminal proceedings are initiated and a plan of investigation is drawn up. The initial investigatory activities include:

— an interrogation of the witness;

— the seizure and examination of any documentation which indicates that the said civil servant undertook certain acts in the interests of the person who offered the bribes, the arrest of the latter and his interrogation;

— the conduct of a confrontation and the initiation of a criminalistic examination (if it is necessary detailed specialist examinations of the handwriting, of the documents or of any other items seized during the search are carried out). The purpose of such examinations is to answer such queries as may be which relate to the accounts and financial expenditures. At the same time, the investigator will initiate an operational search to identify the accomplices and the role of each in the perpetration of the crime.

B. When there is some information about a bribe which has been promised and will be given to a particular civil servant. In this instance, a preliminary verification of grounds for initiating proceedings must be carried out; the possible connections of the public servant must be found out; his official possibilities and courses of action in the interests of the bribe-giver should be revealed. Moreover, the necessary documents should be requested and operative-search measures facilitating the capture of the bribe-takers red-handed should be conducted. In this case, the initial investigatory activities will include:

— an interrogation of the person who first divulged the relevant information;

— the arrest, red-handed, of those concerned;

— a search of the home and place of work of the person who received the bribe;

— an inspection, firstly, of the items bribed, and secondly, of any documents relating to the work of those involved;

— an interrogation of the witnesses and suspects; and

— an undertaking of criminalistic expert examinations, for example, to discern the ownership both of the items received as bribes, and of those items still in the possession of the informer.

C. When certain facts are known about extortion. In this case, the information received must undergo a preliminary verification in order to establish whether or not the bribe-taker actually created those conditions which then forced his subordinate to carry out the unlawful demands of the extortioner. Having confirmed whether or not the civil servant was provoked, a decision as to the initiation of criminal proceedings and the setting up of a formal investigation must be taken. During the course of the preliminary investigation, the investigator makes use of information contained in the criminalistic registers and archives, and he also carries out an operative search. Furthermore, he acquaints himself with the competence of the civil servant under suspicion, receives explanations from the informer or other members of the public, and where necessary organises an audit or inventory in order to confirm the activities of the civil servant concerned during the particular period in question. In the case described, the initial investigatory activities include the following:

— an interrogation of the informer and other witnesses;

— the arrest, red-handed, of he who offers the bribe, to be followed by a search and interrogation of that person;

— an examination of the items bribed;

— the seizure and examination of any relevant documentation;

— the interrogation of the suspect;

— the conduct of confrontations; and lastly,

— the initiation of expert examinations, such as an audit, to decide whether or not the accounts were correctly maintained.

In the course of an investigation, the following theories of the crime will be prepared and verified:

— the bribe actually took place, and information thereon is included in the material which forms the basis on which criminal proceedings are initiated;

— the bribe was real enough, but it was transferred to an imaginary person;

— the public servant was legally in receipt of monies (such as debts repayed), and the person who informed on the bribes was unintentionally misguided;

— the said civil servant did not receive any bribes at all, but was subject to slander as when, for example, he refused to carry out some unlawful demand; and finally,

— in the interests of another, the civil servant concerned carried out certain official duties legally, and he did not receive any bribes.

Bribery is sometimes linked with forgeries carried out by public servants. In the course of the investigation, it is therefore necessary to confirm those theories as to whether or not the bribes are linked with other crimes. Based on these theories, the sequence of investigatory activities, time-limits and concrete performers thereof are determined in a plan. Bribery cases usually consist of many episodes. In mapping out the plan, a provision should be made for organisational and preparation activities, the use of technical means of criminalistics, and the inclusion of specialists in certain investigatory activities. Certain verifying procedures are also considered, so as to identify the causes and conditions which facilitated the bribery. In complex cases when the crime was committed over the various periods, a team of investigators should be set up.

The arrest, red-handed, of a bribe-taker and a bribe-giver is a means of exposing the crime. It is usually conducted in accordance with comprehensive and confirmed information received as to the fact that extortion is taking place. To expose the briber, the investigator can make use of photographs, motion-pictures and operative-search resources.

An arrest, red-handed, is determined by the particular circumstances of the case; it is executed, either at the moment a bribe is transferred, or immediately afterwards. In arresting the bribe-taker, it is important to make sure that he cannot get rid of the real evidence, i. e., the items bribed. In order to identify any accomplices, it may be expedient to carry out the arrests, either at the moment the bribes are transferred, or when they are received by a third party. A red-handed arrest is a tactical operation which is preceded by thorough and detailed planning. It is advisable to carry out an interrogation of the bribe-taker immediately upon his arrest. For not having been able to think up a story for his behaviour or for why he is in possession of the items bribed, he often confesses to the crime straightaway, and divulges correct evidence.

The Search. A personal body search and a search both of the homes of the accomplices to the crime, and of the office of the civil servant in receipt of the bribe, are conducted in order to detect and seize the items bribed and any relevant documentation which may testify to the preparation of the crime in question. In addition, such searches will endeavour to find and remove valuable items and illegally acquired profits. The body search and the search of the relevant premises are usually carried out simultaneously. Especial attention is paid to those letters, postal receipts, various notes, notebooks and telephone numbers which may testify to the existence of links between the accomplices of the bribery. It is also necessary in a search to take note of any enciphered notes and photographs of possible accomplices, knowledge of whom the suspect denies.

An examination of the relevant documentation is an important investigatory activity. In some instances, it facilitates the identification of all those involved in the transfer of bribes; in others, the detection of negligence in maintaining the accounts and of other activities, which helped the bribe-takers; and in yet a third set of instances, the confirmation that certain actions and instructions were or were not carried out by the public servant concerned, and in so doing he acted in the interests of he who offered the bribe. The examination of the documentation will also enable the investigator to detect (a) any false entries and alterations made by the criminal; (b) any unusual order in the processing of the documents; and (c) the presence on completed documentation of the corresponding, necessary signatures, official stamps and notes of various civil servants. The examination must be carried out urgently, for this will prevent the offenders from destroying the traces of their criminal activity.

The Interrogation of the Witnesses. To a large extent, the persons who are able to act as witnesses in cases of bribery depend on the material used as a basis for initiating criminal proceedings. The following persons are usually questioned as witnesses to the crime: those who were extorted, and those who actually saw the transfer; those who participated in the red-handed arrest; fellow workers of the civil servants suspected of bribery, or those who carried out his particular instructions (provided that they were not accomplices to the crime); and those able to describe the personality and behaviour of the bribe-taker (his fellow workers, neighbours and relatives). This group of witnesses can give useful information about the mutual connections between the accomplices in the bribery, and they might well shed some light on the circumstances in which such bribes were transferred. Once such information is received, the investigator can organise a verification of the evidence of the eyewitnesses at the place where the bribes were actually handed over.

In certain cases, *investigatory experiments* are conducted to help verify whether or not it was possible, firstly, for someone to observe the transfer of the bribe, and secondly, for those concerned to perform certain other actions.

A *forensic examination* plays a large role in the disclosure of bribery. Such is often able (a) to observe finger- and palmprints on the objects bribed or on the packaging materials involved; (b) to detect notes concerning the transfer of bribes in diaries, exercise books and notebooks; and (c) to discover traces of the text impressed on the unused pages of notebooks. To investigate same, initiated are the criminalistic examination of documents, the traceological examination of microparticles of materials or substances, and sometimes the comprehensive expert examination.

CHAPTER XXXI

INVESTIGATING CRIMINAL VIOLATIONS OF TRAFFIC REGULATIONS

1. The Criminalistic Description of the Crime

According to the criminalistic description of such offences, criminal violations are always the result of carelessness.[1] If a vehicle is used as a deliberate weapon, and if the result of such use is death or physical injury and/or significant material damage, then such an act is classified as premeditated murder or premeditated bodily harm, and/or the intentional destruction of or damage to property.

Typical traffic offences are motorcar accidents, overturnings, running over barriers, cyclists, pedestrians, and the falling of passengers from vehicles.

Such accidents are often the cause of bodily injury and material damage, and sometimes of the death of an injured person or indeed of several. On a number of occasions, the driver and his vehicle remain on site but sometimes, the driver conceals himself, either on foot leaving his vehicle behind, or, more often than not, in the car, driving off in an unknown direction.

A necessary element of the criminalistic description of traffic offences is that information which describes the road conditions. An understanding of the latter is a rather complicated and flexible collection of information which the driver should always study at the beginning of a journey: the choice of route, traffic speed and directions, braking conditions and the working order of his own brakes, and so on. The term "road conditions" consists of the technical character of the road, the type of road, the condition and type of road surface, visibility, clarity of vision, traffic density, traffic speed, pedestrian movements, the presence of road signs and traffic lights, pedestrian behaviour and the conduct of drivers of adjacent motorcars. The evaluation of these factors predetermines the speed chosen by the driver. The more complex the road conditions, the less chance does the driver have of avoiding a dangerous situation occurring, and the destructive consequences thereof. Therefore, the correct evaluation of the driver's actions depend to a large extent on the relevant road conditions. According to information received, it is possible to divide road conditions into four categories: simple, complicated, very complicated and dangerous.

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[1] There is also another point of view which suggests that breaking traffic laws falls into two categories: intentional or careless in relation to the fact of the offence proper; and careless in relation to the consequences thereof.

The description "simple" suggests that the road conditions are affected by a rather small number of factors and that, therefore, danger does not occur unexpectedly; rather, the driver has time to perceive and understand the danger, and to take appropriate action. For example, when there is only one vehicle on the road and when, at a sufficiently large distance (i. e., in excess of the stopping distance of the car), there appears a pedestrian, walking, at a slow pace, with an even uninterrupted step. If an accident happens in these conditions, then the investigator must regard the actions of the driver as criminal irresponsibility, because the latter sees the pedestrian (who does not perceive the movement of the vehicle), but thoughtlessly reckons he can turn to one side at the very last moment. The conditions are also considered to be simple when there are several cars on the road, if they did not affect the given situation.

The description "complicated" refers to the road conditions characterised by several components (vehicles, pedestrians, road signs, particular features of the locality, and so on) for then a danger can occur rather quickly, and the time in which the driver must perceive same and take appropriate action is relatively short.

In very complicated road conditions, an obstruction can occur so quickly that the driver has to take immediate action for the distance from the vehicle to the said obstruction approximates to the stopping distance.

When the road conditions are described as dangerous, one must realise that the driver is unable to avoid such dangerous accidents as may occur, i. e., when the danger occurs at a distance less than the stopping distance. Dangerous road conditions are usually caused by pedestrians suddenly coming onto the road, by other drivers not obeying the traffic regulations, and less frequently by mechanical failure. As a rule, the driver in such road conditions is innocent, except when he himself creates same. The driver who takes action in a dangerous situation and so avoids accidental injury to whoever has infringed the traffic laws cannot be justified in his actions if, in so doing, he undertakes an illegal manoeuvre such as kills other pedestrians or passengers.

A vital element of a criminalistic description of a traffic offence is that information which relates to the mechanical condition of the vehicle involved.

A traffic offence consists both of the guilt of the driver directly involved in creating the dangerous situation, and of the person who lets a defective motor vehicle out onto the road, etc. In identifying the offender, attention should be paid, (a) to his professional readiness and health, and (b) to the duration and nature of the work carried out immediately prior to the accident.

In most cases, the incorrect behaviour of drivers and pedestrians are the main causes of traffic offences.

Incorrect behaviour on the part of the driver may be any one of the following types, and each may cause an accident:

— drunk driving. Indeed, the very fact of drunk driving on a second occasion is in itself recognised as an offence. Drunk-driving offences usually incur severe consequences;

— driving a vehicle known to be defective;

— a lackadaisical and incorrect evaluation of road conditions. Such mistakes are determined by the personal qualities of the driver, his powers of concentration and his experience, and also by other factors such as the visibility and the amount of time the driver had for avoiding the accident, etc.;

— the driver's incorrect use of the vehicle. Incorrect use of the brakes, for example, can cause the vehicle to lift up and overturn. This is extremely dangerous both for the driver and for others in the vicinity; and lastly,

— carrying passengers in vehicles not designed for such purposes.

Those offences which are most frequently committed by pedestrians include the following:

— crossing the street in front of and close to on-coming traffic;

— crossing the street where it's not allowed;

— emerging unexpectedly from a stream of traffic in which, of course, the drivers' fields of vision are limited;

— crossing the street without waiting for the traffic lights; and

— entering and leaving a thoroughfare in heavy traffic. Such offences are not only dangerous for the offenders, since in creating such accident-prone situations, they often cause others to suffer as well.

2. Theories of the Crime and Planning an Investigation

No matter how obvious may be the road and traffic conditions at the time of an accident, the investigator must always carry out a comprehensive analysis of all relevant facts, and a logical diagnosis of the connections arising between them. This is achieved in the formulation and verification of the theories of the accident. General theories, suggested at the initial stage of the investigation, are directed at answering the following important questions: might it have been possible for the driver to avoid the accident, even though he didn't? did it take place because of other reasons not associated with the road conditions? or was it caused by other persons? In investigating the category of crimes in question, it is usual to propose theories as to the cause of the event.

Causes might be any of the following: an offence of the safety rules committed either by the driver or by other travellers; a technical defect; dangerous road conditions; and a pure coincidence unforeseen by both drivers and other participants in the movement.

In certain conditions depending on the circumstances, it may be possible to propose that the traffic accident was staged, and that a vehicle was used to murder somebody, or to commit some other crime.

Driving offences are usually verified according to the following theories:

— the driver committed the offence blatantly and deliberately;

— the driver perceived the danger well in advance, but all too casually considered how best to avoid same;

— the driver assessed the road conditions incorrectly, and did not see the danger arising although, in such circumstances, he should — and could — have done so; and lastly,

— the driver's incorrect actions were a response to other persons' offences.

The objectivity and totality of an investigation into a road-traffic offence is guaranteed both by the planning of the inquiry in general, and by organising various investigatory activities. At the first stage of the investigation, when as a rule, the investigator has insufficient information for working out a detailed theory of the crime, he plans his activities on the basis of typical road-traffic accidents. Then he uses each newly acquired fact, either to confirm and verify the theories of the crime so far proposed, or to formulate a new theory. At the same time, he changes the plan of the investigation accordingly.

Therefore, the plan first of all should provide those activities which would facilitate original information. These include an examination of the scene of the accident, an inspection of the vehicles involved, and interrogations of the witnesses, victims and suspects.

The sequence of other investigatory activities depends on the particular circumstances of the crime under investigation.

Additional difficulties in the investigation occur in the case of a hit-and-run accident. In some minutes the criminal gets far away from the scene, changes his route, and traces and real evidence are all too quickly lost. To search for the driver and his vehicle, the investigator must plan a whole series of interlinked investigatory activities and operative-search measures. In examining the scene of the accident and in questioning the witnesses, he may well gain that information which is necessary for the conduct of such searches. The investigator outlines the tasks for other members of the workforce as appropriate. If possible, a hot pursuit is initiated without waiting for the results of the examination of the scene.

3. Tactics of Investigatory Activities

An Examination of the Scene of the Accident. The examination of the scene of a road-traffic accident is carried out as soon as information thereon is received. Apart from those factors which determine the urgency of any examination, there is one other consideration which is characteristic of any road-traffic accident and it is this: the need to re-establish normal road conditions as quickly as possible. Even those road accidents whose consequences are insignificant, do disturb the traffic flow, and affect a large number of people.

The complexity of a given examination is its specific feature. On the scene of the crime, the investigator must search for and identify various traces, carry out measurements, draw up plans or diagrams of the accident, and take photographs. Apart from all this, it might be necessary to help the victims, to provide protection and to identify eyewitnesses, etc. The number of persons who should be brought into an investigation depends on the nature of the accident. The presence on the scene of the crime of the vehicles involved and of other traces characteristic of the accident in question, and sometimes even the presence of a corpse or victims in a state of shock usually means that certain specialists should participate in the investigation. Such might include technical advisers, criminalists, medical and other experts. Their safety during the examination should be guaranteed, so traffic flow if necessary should be diverted. Operatives are drawn in to find the driver who has gone into hiding, and to identify the witnesses. It is always desirable to involve in the examination any other drivers who might have been involved in the accident. This facilitates the consideration and verification of their evidence during the course thereof.

On arriving at the scene of the accident, the investigator initiates a series of urgent measures. First of all, he must ensure that the examination will be carried out in safety. He will therefore position traffic controllers, road signs and temporary fences as necessary. If there are any victims on the scene of the accident, they will need first-aid treatment. If the investigator is not sure he will be able either to get immediate first aid or to call a doctor, then he should convey the victims to the nearest medical centre. It is not always possible to stop all the traffic on the scene of the accident while the examination is being carried out. Before removing the vehicles and those other items which are hindering the flow of traffic on the highway, it is first of all necessary, (a) to identify the mutual disposition of the vehicles, traces and other items, and (b) to take photographs.

On initiating an examination, both of the scene of the accident and of the objects situated therein, the investigator acquaints himself with the general outline of the situation. For an elucidation of the circumstances of what happened, he listens to all that those police and safety officers who were first on the scene have to say, and then questions the drivers and eyewitnesses. The receipt of such information as they may give and a general review of the scene of the incident facilitates a more purposeful conduct of the examination.

The sequence of the examination depends on the complexity of the situation. As soon as he arrives at the scene, the investigator should in each case endeavour to examine and thus determine the less stable traces.

Characteristic objects of a road-traffic accident are the road, the car, and the person (or corpse).

In examining the road, the nature of the surface is determined (whether or not it is asphalt, concrete, stone or ballast), as is its condition (whether or not it is dry, wet, muddy or ice-covered), and its classification (what is the length of gradient, both along and across the road; of what construction are the main parts of the highway; whether or not there are any turnings, what is the severity of any corners; whether or not there is any protective fencing, and so on). Furthermore, it is necessary to define the visibility and driver's field of vision.

There may be other traces resulting from a road-traffic accident taking place on the highway. Braking traces are especially important. Determining the stopping distance of a vehicle is not easy, insofar as the point at which the driver first put his foot on the brakes does not necessarily coincide with the first part of the visible trace. The vehicle was already slowing, but the tread marks were not yet apparent. The length of the stopping distance is measured from the first visible tread mark or, in its absence, from the first skid marks. Careful attention must always be paid to the external appearance of these marks. They might be just tread marks, or wheel skids, or a mixture of the two, that is, when the tread changes into a skid, and vice versa. If the skid marks of the right-side wheels are shorter or longer than those of the left-side ones, separate measurements of each are recommended. Brake marks need not necessarily be continuous, they may also be broken. The length of each skidmark should be measured, as too should the distances between them.

The exact measurement of the stopping distance is very significant, for once known, it is then possible to work out the speed of the vehicles at the moment of impact, to determine the full stopping distance,[1] and to establish what was the technical possibility of preventing any damage.

Other items and traces may be found on the roadway: oil stains, petrol, water from the damaged vehicle, paint samples, bits of the headlights, other parts of the vehicle, and fallen cargo.

In examining a corpse, there are several characteristics, depending on the nature of the road-traffic accident, which should be borne in mind. In order to recreate the way the event took place, it may be useful to note the position of the corpse, its pose, and the places where blood stains, hair, parts of the brain and other parts of the body were located.

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[1] The full stopping distance is defined as that distance travelled by the vehicle, both during the reaction time of the driver (the time during which he perceives the emerging danger and decides upon the appropriate action) and during the time under brakes, that is, the distance travelled by the vehicle until it has finally come to rest.

The presence, position and character of any damage on the body of the corpse enable the investigator to reconstruct the exact position of the victim at the moment of impact. Fractures in the upper third of the thigh, for example, are usually caused by the impact of a lorry's bumper, while injuries on the shin suggest the cause was a collision with a car. A broken leg caused by the impact of a bumper, along with other accumulated factors, enable the investigator to work out the direction of impact, the width of the bumper, and so on.

The picture of the accident is reconstructed by the investigator as follows: (a) examination of the clothes of the victim; (b) calculation of the position of the victim at the moment of impact; and (c) detection of traces from the tyre treads, and gathering paint samples and other items of real evidence, such as may enable him, in hit-and-run accidents, to work out what type of car was involved. Clothes should be removed immediately after the victim is taken to a medical centre. The investigator should accordingly advise the administration of that centre to keep the clothes just as they were when the victim was brought in. An examination of the vehicle may help the investigator to discover traces formed at the time of the accident, to recreate the way the accident happened, and to find out the mechanical condition of the vehicle concerned.

It is very easy to find traces and damage on the vehicle, because they are usually quite visible. It is considerably more difficult, however, to detail the type, form and measurements of such damage and traces. In fact, a verbal description thereof is quite inadequate, and they should, therefore, be photographed.

In examining the driver's cab, the investigator should study the state of the control levers and instrument panel. All the above traces should be analysed with the help of motor vehicle mechanics and road-accident criminalists.

The mechanical state of the vehicle should be determined by thoroughly studying the brake system, the steering mechanism, the tyres and the lights.

To check the brakes, the following experiment is recommended: a police officer drives the vehicle in question at a certain, defined speed, and then applies the brakes. Such a test can be recorded in the minutes of the examination in approximately the following manner:

"Applying the brakes at a speed of 30 km/h on dry asphalt caused skid marks from all four wheels, 8 metres long."

If the investigator has some measuring equipment at his disposal, then the corresponding information should also be recorded in the minutes. If such are calculated automatically on a special tape, they should also be included in the minutes.

In checking the steering mechanism, the wheel-play and the backlash in the steering column should be measured.

Tyre pressure can be checked with a pressure gauge, and the condition of the tyres should be noted, in perhaps the following manner: "the tread is almost new" or "the tread is 50 per cent worn-out".

If the accident happened at night and the headlights were not damaged, the upper beams and lower beams of the vehicle under examination should also be checked. The results of such are recorded like this:

"With the lower beams switched on the road is visible at a distance of 40 m, the upper beams at 120 m."

Such tests can be carried out after all the traces and damaged parts are examined and noted.

The damage done should be described accurately. In so doing, the state of the car and of those particular parts which affect safety should be well noted, and photographs of the general damage, along with the nodal picture of the units, should be included.

Any luggage involved, and its disposition in the vehicle, should also be studied.

The results of the examination of the scene of the traffic accident should be laid out in a specific manner as required by the legal system. Accordingly, it should include the following information: (a) the size and relative dispersal of the various objects, and (b) the damage done, that is to say, the verbal description thereof is rather difficult. These results usually form the initial basis for an expert examination to be made. That's why, apart from having a precise description of the scene of the accident in the record, it is necessary to supplement and illustrate same with photographs, plans, diagrams and schematic outlines.

The Interrogation of the Driver. If the driver is still present on the scene, the investigator will acquaint himself with the former's driving license and find out whether or not he was under the influence of drink at the time of the accident. A preliminary verification of the presence of alcohol can be carried out with a portable breathanalyser. The results of this test cannot be used as evidence, however, for drunkenness can only be established via forensic-medical examination.

Depending on the information available to the interrogator and the procedure applied to the driver, the latter is either questioned as a witness or interrogated as a suspect. As a result of an incorrect perception of the road conditions and under the influence of what has happened, the driver may become genuinely confused and thus consider, either that only he is to blame, or that the entire guilt lies at the feet of others. He therefore describes the event, his conduct and the behaviour of others inaccurately. Furthermore, the fact that the driver may deliberately distort the facts in order to mitigate or obviate his guilt, should not be excluded. This particularly affects his evidence as to traffic speeds and relative distances. In using such false evidence, the driver sometimes creates an inherent contradiction, and such can only confirm his guilt. For example, a driver, travelling at the permitted speed of 60 km/h, noticed an obstruction which suddenly appeared 30 metres ahead of him. He applied the brakes. But he was unable to avoid the collision, because it was just technically impossible (the full stopping distance at that speed is 40-41 m). In wanting to show that he had been driving with all due care and attention, the driver reported — untruly — that he had been travelling at 40 km/h. At that speed, however, the stopping distance is 20-21 m, and it is therefore obvious that he would have been able to avoid the accident. The authenticity of a driver's evidence should accordingly and in all cases be confirmed by other proofs of evidence.

The Interrogation of the Victims should also be carried out as one of the first interrogatory activities, for they are able to provide valuable information as to the circumstances of the accident. If their state of health so permits, they should be interrogated on the spot. If they are hospitalised they should be questioned as soon as the doctor allows. Victims are asked about the following: firstly, the road conditions at the time; secondly, the way they acted; and finally, the way the other participants acted and reacted. The evidence of a victim may be affected by his age, profession and psychological state of mind. A victim might even give false evidence, and willingly, if he is a relative of or he is friendly with the driver in question, or if he wishes to disown all personal responsibility for the event, and so on. In order, therefore, to evaluate a victim's evidence correctly, it should all be confirmed independently.

The Interrogation of the Witnesses. The factors which should be identified during such interrogations can be divided into four groups.

The first group concerns the psychophysiological state of the witnesses (their vision, hearing and their emotional state); the conditions in which they perceived the events (the place they were situated, what was the visibility, etc.); and how they came to notice the event (e. g., by the screech of the breaks). The second group relates to the conduct of the victim. The third, to what the driver(s) did and how. The fourth, to the road conditions at the time (the dispositions of the vehicles, the way they were moving, the presence of obstructions, etc.). The particular questions which should be asked during the interrogations of witnesses depend on the nature of the event. For instance, to explain how a motor vehicle ran over a pedestrian, the investigator needs to find out:

(a) to and from where the victim began to move;

(b) how he was moving, at what pace, whether or not he was running, at what speed he was travelling;

(c) whether or not his movement was regular or he was sometimes running, sometimes walking; whether or not he rushed about, etc.

(d) whether or not the pedestrian emerged on the road from behind the moving traffic;

(e) where the accident happened;

(f) which part of the vehicle hit the victim, and where he fell;

(g) whether or not he was carried along on the bonnet, bumper, chassis or body of the vehicle, and if so for what distance; and finally,

(h) whether or not he fell under the wheels of the vehicle and whether or not he was dragged along for some distance; if so, how far.

To understand the actions of the driver and the resulting movement of his vehicle, the investigator should seek the answers by the witnesses to the following:

(a) the speed at which the driver was travelling;

(b) the way he was driving (straight ahead or he was turning to left or right);

(c) how and with what the vehicle was loaded;

(d) whether or not he had any passengers; and

(e) what he did after the accident (drove back, drove on, called for help for the victims, etc.).

Getting the answers to these questions is not easy, for it is sometimes rather difficult to perceive such things. Evidence as to speeds and distances is usually just a personal estimate. Accordingly, the evidence of an eyewitness may be supplemented by his showing the place where he had stood, and the point at which the victim appeared, and so on. The record should contain an enclosed diagram, to show where the witness had been, and to indicate where the objects mentioned in his evidence had been situated.

An investigatory experiment is usually carried out in order to establish and verify the speed of the vehicles and pedestrians, and to confirm the visibility and find out various other factors. Such tests usually take place on the roadway. It is therefore necessary to take certain measures well in advance, in order to ensure the safety of the participants. In preparing such an experiment, the investigator must first of all decide whether it is admissible to conduct the experiment in conditions which most closely resemble those which had existed on the scene of the given accident. It is considered inadmissible to recreate skidding, emergency breaking, overturnings, relative positions of vehicles rapidly approaching each other, just as they had prior to the accident under investigation in order to establish whether it was technically possible to avoid the accident.

In establishing the speed of the victim, judicial and investigatory agencies run into considerable difficulty. Yet the exact knowledge of same is often the most important factor in deciding whether or not a crime took place, and this is because the technical feasibility of avoiding an accident depends on how long the victim was in the driver's field of view. To calculate, experimentally, the speed of the pedestrian (victim), the investigator must take into account the fact that he cannot determine the exact speed of the pedestrian in a test involving other persons. He therefore has to determine upper and lower limits to the calculated speed of the victim. Accordingly, the investigator should carry out the experiment in a given set of road conditions, but with the participation not just of one, rather of several persons, all of similar height and age, and all equipped alike.

A Technical Expert Examination. In the investigation of a road-traffic accident, the significance of such an examination is determined by the multiplicity of facts to be established thereby. The examination must determine the speed of the vehicles by skid marks; find out whether or not the running over could have been avoided; and carry out a technical evaluation of the driver's actions in the particular road conditions concerned. Without such information, all of which can be established with the help of a technical expert examination, the investigator cannot conduct an investigation.

A particular feature of this examination is that factual information about the case under investigation serves as original material. This information includes the calculation of certain measurements carried out during the investigation of the scene of the accident (for example, of the skid marks), or that contained in photographs (the relative disposition of the vehicles, for instance). Further information necessitates a critical evaluation of the evidence of the eyewitnesses and drivers as to the speeds and distances at such and such a moment, and so on. The investigator collects all this information and informs the expert as to which particular aspects require his attention. In his instructions initiating such an expert examination the investigator is not allowed to suggest that the expert can acquire original information from the case material, for that would mean giving the expert that information, such as is acquired as a result of an investigation of the real evidence, the evaluation of which does not lie within his competence. The investigator must pay particular attention to the gathering and evaluation of original material, for any inaccuracy could easily influence the expert's conclusions. In view of the specific nature of a technical expert examination, the investigator is advised prior to the initiation of same to consult with the expert as to sufficiency of material already collected, the possibility of conducting an examination in the particular situation in question, and the formulation of questions therein to be answered.

A Criminalistic Examination. The criminalistic examination most frequently conducted is that which involves the examination of traces. Such is initiated, either to establish the particular make and mark of an item (the type of vehicle, the make of shoe, etc.), and in these instances, the methodology of the investigation differs but little from that pursued in other criminalistic examinations conducted in other criminal cases. Such may be asked to determine the ownership of a particular object, to identify a certain object on which a trace is found, or to establish the method for making up the traces. Such are usually those traces found on the vehicle, on the clothes or the body of the person, or on other objects. These examinations help the investigator to identify the following:

— the ways the traces were formed (what parts of the vehicle left the traces, their sequence, and in what direction physical force was applied to form the traces);

— the mutual disposition of the items at the moment of impact (the initial blow, the resulting skid, and then the severance and the fracture);

— the causes of wear and tear in the vehicle, the time when such deterioration started to appear, and the conditions of those parts of the vehicle damaged in the accident.

In studying the way in which the traces are formed in road-traffic accidents it is admissible and even expedient that an autotechnical-cum-trace examination should be carried out.

4. Forensic-Medical Examination

Along with the more usual questions studied with the help of *forensic-medical examination* (establishing the severity of any injuries, or the causes and occasions of death, etc.) during investigation of a road-traffic accident also solved are the questions relating to the way in which the victim was injured. Accordingly, the following must be answered:

— whether or not the vehicle ran over a particular part of the body, and whether or not the injuries were received as a result of a blow;

— what the victim's position was at the moment of the accident;

— whether or not the victim suffered injuries typical of those usually suffered by drivers and passengers in an accident.

Apart from the above expert examinations, it may be necessary in a road-traffic accident investigation to initiate other forensic examinations (for instance, to examine the fingerprints or to inspect the metallic substances involved), but such depends on the particular circumstances of the case.

CHAPTER XXXII

INVESTIGATING CASES OF ARSON AND CRIMINAL INFRINGEMENTS OF FIRE-SAFETY REGULATIONS

1. The Criminalistic Description of Arson and Criminal Infringements of Fire-Safety Regulations

In cases of fires, there are usually certain typical circumstances thereof which affect the methodology of the investigation:

A. Fires in the home. Such are very widespread, and they usually occur as a result of (a) disrepair or incorrect use of electrical heating appliances, heating stoves and gas cookers (leaving them switched on without supervision); (b) short circuits, and (c) unextinguished cigarette butts, often discarded by persons under the influence of drink. Fires in the home are sometimes caused by children who, as a result of lack of parental supervision, get their hands on matches, cigarette lighters, fireworks, cartridges, etc.

B. Factory fires caused by:

(a) infringements of the fire-safety regulations and/or the technical rules and regulations laid down for the care of combustible liquids and gases, and other inflammable materials; and for the use of primary products and raw materials liable to self-ignition;

(b) breaking the rules pertaining to the use of electrical and welding equipment;

(c) various defects in the electrical mains and power supply, and/or in some of the electrical equipment;

(d) defects in the cooling and ventilation systems;

(e) negligence in the use of heating systems, and a careless regard to fire; and

(f) smoking in a no-smoking area.

C. Fires in stores and trading enterprises are usually caused by infringements of the fire-safety regulations, and the rules for storing and preserving valuable goods. They can also be started by a careless regard to fire and self-ignition. It should furthermore be noted that such fires are sometimes the result of arson, committed to conceal a misappropriation of goods carried out in shops and stores.

D. Fires on the farm, in stables and repair sheds, in fields where grain is being ripened, and in meadows and pastures and other places where unthreshed corn, hay, and straw are stacked. Fires in the open field take place mainly as a result of careless regard to fire (in smoking, camp-fires, etc.), but some are caused by the spontaneous combustion of that hay and straw which was stored in a wet and undried condition. Fires in repair sheds, live-stock farms and similar facilities, however, usually occur as a result of either short circuits in the electric mains, a careless use of oil lamps, or a failure to observe the no-smoking regulations. Moreover, fires may also occur as a result of negligence when performing electric or gas welding.

E. Forest fires. In hot, dry summers, the cause of such fires is usually carelessness in regard to fire (unextinguished fag-ends or campfires), ignition from sparks in vehicles, self-ignition of peat-bogs, self-ignition under the rays of the sun and strikes of lightning.

F. Fires in vehicles (the ignition of freight- and tank-cars containing highly inflammable and combustible substances, and fires in railway stations, river-boats and sea-going ships). Tank-cars of highly inflammable liquids often ignite because of an infringement of the rules for their transportation, inadequate washing and drying of those tank-cars used earlier for carrying different compounds, and a carelessness in regard to fire. Axle boxes sometimes ignite as a result of an oversight by the greasers, but also as a consequence of sand and other extraneous items falling into the boxes. Fires on river-boats and sea-going ships as a result of the careless behaviour of passengers with regard to fire, technical defects in the engine room, and infringements of the fire-safety regulations on board.

G. Fires in cultural and social centres (clubs, cinemas, theatres, and so on) usually occur from discarded, unextinguished cigarette ends and matches by a member of the audience, but they might also be caused by sparking in the electricity supply.

H. Fires caused, firstly by the diffusion of gases, and then by the subsequent explosion (as, for example, when there's a gas leak in a confined space); and finally,

I. Arson.

In the conduct of an investigation into a fire in one of the above more typical situations, the content of a theory as to how the fire was started, the circumstances which need to be ascertained, and the system of measures needed to confirm same, differ from each other quite significantly.

If one cares to summarise the information acquired as a result of investigatory, judicial and expert experience as to the immediate (technical) causes of a fire, then it is possible to subdivide them into four groups:

(1) an open fire which starts to burn because of the application of a naked flame, a white-hot substance, a spark, or a flash of lightning;

(2) spontaneous combustion, i. e., the ignition of a substance caused by an increase of temperature in the surrounding medium but without the application of a naked flame (from contact with hot surfaces, by a sharp increase in pressure, from heating a substance to its ignition point, from friction, from exothermic chemical reactions or by radiant energy);

The ignition point for a particular substance is constant, but may be changed depending on the content of oxygen. It may also be affected by an admixture of steam and inflammable gases, by the level of pressure, or by the nature of the surface of the heating body or in the capacity of the container in which the said substance is located.

(3) self-ignition, that is, ignition under the influence of a chemical reaction (decomposition, the formation of a compound or oxidation); a biological process (germination, putrefaction or the vital activity of microorganisms); or a physical phenomena (adsorption).

Almost all solid, liquid and gaseous substances can self-combust, but a particular type of substance can self-combust all by itself (in the accepted terminology of things, these substances make up the first group); the others (the second group) can only do so on contact with particular substances.

Those substances which most frequently burst into flame are those which are fragmented, or those which are impregnated with oil — rags, old clothes, sawdust, oakum, cotton, and that sort of thing. Certain chemical substances and mixtures can ignite on coming into contact with air (hydrogene-fluorides, metallic dust, calcium sulphide and sodium sulphide), or on mixing with an organic substance, or with liquid or solid oxidising agents (oxygen, nitric acid, sodium peroxide, potassium permanganate and others). For this reason, phosphorus is stowed away and transported under a layer of water, while potassium and sodium are carried under a layer of kerosene or mineral oil.

Certain chemical compounds, on being added to or mixed with certain other substances, cause them to ignite. For example, neither glycerine nor potassium permanganate ignite by themselves, even under the application of intense naked neat. But a mixture of these substances creates a furious fire, for as a result of the chemical reaction, heat and oxygen are released, which on combining with the products of the decomposition of glycerine, cause ignition.

(4) an explosion. An explosion of diffused chemicals, and sometimes a concentrated explosion (for example, a mine) can cause surrounding materials to ignite and start a fire. It is necessary to bear in mind that an explosion may not be the cause of the fire, but rather a consequence thereof. For in the incomplete combustion of certain substances, various other compounds may be formed, and on mixing with air, they may form an explosive mixture. Therefore, in a simultaneous fire and explosion, one must establish whether or not the explosion was a cause or a consequence of the fire.

In investigating a fire, it is necessary to take into account not only the possible reason for why the fire started, but also the conditions which caused it to increase and spread; such reasons might include the presence of inflammable materials; litter; the absence of or lack of maintenance in the fire-fighting equipment; a faulty or non-existent fire-alarm system; absence of fire barriers; the spilling of inflammable liquids; explosions; the deformation and collapse of elements of buildings; a failure to observe the fire-safety regulations both in the fire brigade, and the unpreparedness of the workers on site for just such an emergency.

From the criminalistic aspect, arson and the criminal infringement of fire-safety regulations are characterised by the presence of specific material traces which can be observed on the scene of the fire. Thereby can be found: the source of the fire (the place where it first ignited), with its characteristic signs, burnt out objects, corpses, both animal and human; traces as to how they approached the place of ignition (shoes, or vehicles); specific traces of arson on the scene of the fire or on the performer of the arson (traces of an inflammable material or singeings on his clothes or hair, traces of possible burns on his body, and so on); items discarded or dropped by the arsonist after committing his criminal deed; traces as to the presence of a guilty party in the case of a forest fire: empty food tins, bottles, bits of newspaper and wrapping paper, fag-ends and other items on which he might have left his fingerprints.

Fingerprints may be found on window panes (especially where soot has gathered), and also on empty reservoires used for storing inflammable substances. These traces on glass, metal or other fire-resistant surfaces often survive a fire because, having being exposed to great heat, they are covered with soot.

The centre of the fire is where most of the information can be found, and it may be indicated by comparable objects which suffered the greatest degree of burning. Here may be found the instruments of arson: bottles and jars with remnants of an inflammable liquid therein; fuses, old rags, wadding and oakum impregnated with an inflammable liquid; remains of fire-conducting cord; gas cylinders and other technical appliances and equipment for delayed ignition, etc. It may also be possible to detect other items at the centre of the fire: burnt-out objects indicating the place where the fire started; technical defects in inflammable equipment, the electric mains and/or in electrical circuitry and appliances; wires with traces as to a short circuit; and burnt-out heating equipment, electrical kettles and irons etc. There might also be some concentrated blow-holes indicating the direction of the fire by thoroughly destroyed materials and constructions, the so-called "fire-cone" — traces of combustion in the form of a triangle, the peak of which (where the item is most severely burnt) points to the source of the fire; and other symptoms as to how the fire spread, dependent on fire barriers, the direction of the wind, and other meteorological conditions.

The source and centre of the fire may sometimes be determined (with the help of a thermal test prod) by so-called "heat trace of the source", that is, by the area of those structures immediately above the place where the fire started, where the heat was greatest. The source of the fire may also be the place wherein are found cigarette-ends, matches and remains of an unextinguished bonfire, etc.

The items found at the source of the fire are of great significance in criminalistics: burnt-out or charred items (bits of igniters, short-circuited conductors, and so on), and the by-products of the fire (coals, cinders, soot and ashes, as well as metal, glass and other unburnt and/or fire-resistant items, etc.). At the source of the fire (in the earth under the floor, in boards and other objects of wooden construction), there may be some kerosene, naphtha and other inflammable liquids. Having examined the ashes and other remains of the fire, it is possible to determine which substances burnt, in what quantity, and what inflammable substance was used to start it all.

Another necessary element of a criminalistic description of an act of arson is the set of marks as to the premeditated action of an arsonist. An analysis of practical experience suggests that there are the following typical symptoms of arson:

(1) the discovery of two or more independent sources of inflammation on the scene of the fire;

(2) the occurrence of a fire in a place where a fire could not be started accidentally through self-ignition, spontaneous combustion, or explosion;

(3) the presence on the scene of the tools of the arsonist;

(4) the disruption of automatic fire-warning and fire-fighting systems, damage to fire-fighting equipment, and the creation of other conditions which would tend to hinder any fire-fighting effort (for example, damage to a fire-hose, or the placing of barriers and obstacles on the approach route to the fire, etc.);

(5) creating those conditions which facilitate the intense spreading of the fire (for example, spilling of petrol, pouring inflammable gas into the premises, or switching on the ventilation to increase the draught of the fire);

(6) the presence of certain factors which suggest the fire might have been started to conceal another crime (the misappropriation of valuable goods or documents; a discrepancy between the quantity of valuable goods that are actually burnt, and that as reported by the person responsible; or the detection of a corpse with the signs of a violent death which occurred prior to the start of the fire);

(7) the origination of the fire in an office containing financial papers, book-keeping accounts, cash records and trade registers in which are recorded trading transactions in valuable commodities;

(8) a fire occurring in a storehouse on the eve of an audit to be initiated as a result of signals to a misappropriation taking place; and finally,

(9) the presence of certain factors which suggest that various items of furniture, clothes and other valuables were removed from a house prior to a fire taking place.

2. Theories of the Crime and Planning an Investigation

Investigating arson and criminal infringements of fire-safety regulations is quite difficult. Those occasions when the cause of the fire is evident and beyond doubt right at the beginning of an investigation are relatively rare. Investigations are much more frequently initiated with the identification of the cause of the fire, and with the initiation and verification of certain theories of the crime as to how the fire was started. Establishing the cause of the fire enables the investigator to work out substantiated theories as to its culprit and the motives for his crime.

Establishing the immediate cause of why the fire started, developed and spread, enables the investigator to identify the one who caused the fire. The technical reason does not in itself, however, form a basis for a legal evaluation of the case. It is therefore necessary to identify that particular, fundamental cause which is linked to the guilt of certain persons. In this sense, infringements of fire-safety regulations and arson can be regarded as a cause of a fire. The possibility of an accidental nature of fire should not be excluded, of course, especially in those places where the risk of fire is great (as in those instances where there is an unforeseen diffusion of gases and subsequent explosion, a case of spontaneous combustion, lightning, or accidental ignition from radiant energy and so on). There are also those other occasions when fires are started deliberately yet for no purpose, by children or mental patients suffering from pyromania or alcoholism.

An overall theory of the origin of a fire as a result of an infringement of the fire-safety rules, consists of a series of separate theories, each referring to a particular infringement and the culprit therein.

An investigatory theory of an act of arson also consists of several parts; the results of their verification enable the investigator to decide whether or not the overall theory is correct. These partial theories, relating as they do to the overall theory of the crime, are submitted to verification during the first stage of the investigatory activities, and such include theories as to the time the crime was committed, the means by which it was executed, the criminal involved, and his goals and motives in committing the crime.

In preparing a theory as to the way the crime was committed, the investigator should take into account the fact that, in order to carry out his criminal intentions, the arsonist might make use of one of the common technical means of starting a fire listed above. Thus he may resort to starting an open fire (by igniting old rags soaked in an inflammable liquid, using various other forms of setting it all ablaze) or to creating the right conditions for spontaneous combustion or self-ignition, or to carrying out an explosion.

In elaborating a theory as to when the arson was carried out, the investigator should remember that the time at which the fire appeared (that is, when it was first noticed by an eyewitness), may differ considerably from the time when the arsonist did all that was necessary for starting the fire, especially if he used igniters or delayed-action explosives, or indeed if he arranged everything for a spontaneous combustion or self-ignition of some substance or other on the site.

A detailed formulation and verification of investigatory theories as to the goals and motives of the crime often help to detect the arsonist. It is sometimes possible to detect signs of these goals and motives even during the examination of the scene of the fire, and these often indicate the correct lead in the search for a particular individual.

The investigator works out the goals and motives of the arson by taking into account both the particular circumstances of the events in question, and the general experience in examining cases of this category. Practical experience suggests that arson is often carried out for purposes of personal revenge, the concealment of traces of another crime, such as theft, murder and rape, and the receipt of insurance payments or some other purpose.

In the course of the investigation of fires, other theories concerning the various circumstances in a case should also be verified.

In verifying the general and particular theories proposed earlier, the following items in the planning of the investigation should be among the first measures to be undertaken: an examination of the scene of the fire and of any real evidence; an interrogation of the eyewitnesses and others who were first to arrive at the scene; the initiation of a technical expert examination and, if there are any victims, the conducting of a forensic-medical expert examination; a search; the carrying out of such preventive measures as may be necessary; and finally, the examination and interrogation of the suspect as soon as he is identified.

Inspections are carried out mainly for establishing the causes of the fire and identity of the culprit. In accordance with the instructions of the investigator, the inspectors analyse and generalise any information about such infringements of fire-safety rules as may have taken place on the scene of the fire; about any deviations from the laid-down rules and regulations for the use of technical equipment and/or of the production processes; about any cases of thefts; and about any threat which may have been made to the management of the enterprise. In addition, they try both to verify the conduct and whereabouts of the suspects prior to the fire, at the moment it started, and immediately afterwards; and secondly, they inform the investigator (or the leader of the team of investigators) accordingly. In investigating arson as well as forest fires and fires on the farm, the investigators endeavour to identify those suspects who had been in the immediate vicinity prior to the fire, or those who had lit a camp-fire which then caused the blaze, and any eye-witnesses of the subsequent fire. In addition, the investigators study the state of any documents relating to the production workshops where the fire first started, and they try to establish whether or not any changes were introduced therein, whether or not some of them were destroyed, and if so, who took part in thus concealing the documents, and who had a vested interest therein.

An important part of the planning of an investigation is devoted to the initiation of preventive measures. In particular, having studied the specific features of the events in question, the investigator may call for one or some of the following:

(1) the immediate elimination of those infringements (a) of the fire-safety rules, (b) of the laid-down production routines, (c) of the rules and regulations for the storing, use and transport of explosive and highly inflammable substances, etc., such infringements being likely to cause a fire. If, according to information received, in an establishment where the risk of fire is great a fire was caused by poor technology, defective apparatus, deviations from the projected work-plans or the use of poor-quality raw materials, then other enterprises of the same type must be informed of same immediately, so that they can take urgent measures to prevent a similar event happening in their establishments;

(2) an increase in the guarding of the establishment;

(3) the setting-up, where necessary, of an automatic alarm system, one which is sensitive to heat, sound and/or smoke; and

(4) a tightening up of those controls as pertain to fire-prevention and technical safety.

3. Tactics of an Investigation

The Inspection on the Scene of the Fire. In the course of such an inspection, the investigator tries to establish the circumstances and immediate causes of the fire, the whereabouts of the source and centre thereof, the way it spread, and the ensuing consequences. And this he does by thoroughly examining both the situation on the scene of the fire and such material traces of the crime as have survived. The scene of the fire is a very important source of information, both as to the crime and to the criminal. Even when the premises are totally destroyed, important items of evidence may still be found.

Specialists are called in from the nearest fire-research station to participate in the inspection, and they should bring such equipment as may be necessary (electric current measuring instruments, for example, a set of thermocouples and heat-testing prods, or indicator tubes for analysing the air); other participants include forensic-medical experts (if there are any victims involved), and experts in criminalistics. Where necessary, that is, in those cases where a fire took place in a factory of a certain type, such experts might include chemical engineers, electricians, technologists or whatever, and if any cattle died as a result of the fire, a veterinary surgeon will also be called in.

In examining a burnt-out object, it is sometimes expedient for those involved in the inspection to acquaint themselves with a similar object.

The inspection usually starts as soon as the fire is extinguished. Even prior to such a time, however, the investigator should conduct a general observation of the surrounding locality, and initiate such measures as may be necessary for preserving such traces and real evidence as may be found. Accordingly, he should organise a guard to look after track of footprints left by the suspected arsonist; prevent any loss of or damage to items extracted from the fire; and with the agreement of the head of the fire brigade, limit any unnecessary dismantling of the burnt items and structures. It may also be expedient to take photographs and motion-pictures of the separate stages of how the fire developed and spread, as well as how it was localised. In so doing, the pictures are always taken from the same points, and the corresponding times are noted. In photographing the scene of the fire, it is necessary to take shots from all four sides, or from two diagonally opposite corners; in this way, it is possible to show the overall scale of the destruction. Internal damage is photographed in each of the premises separately, and especial attention is given to that place where it is felt the fire started or where an explosion occurred.

At the same time, the investigator, in the presence of invited witnesses, records in the minutes of the inspection the following bits of information: the colours of the flames and/or of the smoke; the smells and general tastes noticed on the scene; wind speed and direction; the intensity of the fire, and how it spread.

It may be expedient and more effective to examine the various parts of the scene of the fire in the following sequence: first of all, a general observation of the scene and its environs should be conducted, the identification of the place where the fire started being of special importance. There follows an inspection of the centre and source of the fire; then following the spread of the fire the other parts involved are examined. Finally, the inspection comes of the adjoining areas where, during the initial overall observation, footprints and traces of vehicles were found going to and from the scene of the fire. The examination of the centre of the fire must be very thorough, for here may be found those traces which explain how the blaze caught fire. It may therefore be necessary to remove certain items for subsequent analysis: charred-brands, ash and other remnants.

Metal chests and safes wherein documents are stored should not be opened until thoroughly cooled.

If the fire started during a thunder-storm, the investigator must find out whether or not the ignition took place as a result of a flash of lightning. This can be detected on the scene by the following series of indicators: metallic items fuse, wooden parts of the building splinter, brick and stone works crack, and trees are split apart. The minutes should record whether or not the burnt-out premises had been fitted with lightning conductors, and if so, of what height and at what mutual disposition.

If a corpse is detected on the scene of a fire, it should be examined by forensic-medical experts. Along with the general rules for the conduct of an examination of a corpse, it should be remembered that there are certain extra specific features which relate to the inspection of a burnt corpse:

— its position relative to the exits of the burnt-out premises;

— its pose (and if it is that which is described as "the boxer's pose", then this would suggest the body was burnt with naked flames);

— the measurements of the corpse, and of the separate parts thereof [1];

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[1] In identifying a charred body, it is necessary to bear in mind the fact that at high temperatures, there is a resulting loss of body water; as a consequen-

— physical damage to the corpse, and details of its bone and dental structures (in those instances where the body has been badly burnt);

— the presence on the corpse of burns, and if so, of what degree; and signs as to whether or not the burns occurred while the victim was still alive. If, for example, such burns are of a rose-coloured tint, then carbon monoxide is or was present in the bloodstream, and this is a sign that the hapless person was still alive when he was trapped by the fire.

If one side of the body was burnt but the other was protected, there will be cracks with smooth yet sharp edges on the corpse, such as occur in a cut wound. These should of course be noted, but in trying to explain why the body was injured, the investigator need not be distracted by them.

Separate bits of a burnt corpse, in particular charred bones, should be removed from the scene of the fire and sent for expert examination so as to determine the age and sex group of the victim concerned.

The clothes should also be thoroughly examined to establish their condition, to see if there is any damage thereon, to test them for smells, and to find out what, if any, were the contents of the pockets. The remains of the burnt clothes on the corpse of a corpulent person may have become impregnated with melted body fat; they may, therefore, give the impression that they had been covered in kerosene or some other oily, inflammable substance. This must be taken into account in distinguishing between a case of murder, suicide or accident.

Sometimes, a body may have suffered a significant degree of burns, and yet at the same time retain all its hair and all its clothes. This is explained by the fact that the material of the clothes and the hair of the corpse are more resistant to the effects of high temperatures than are the skin and the muscles of the corpse.

The body should be photographed and identified on the scene of the fire. Before a burnt corpse is taken away, it should be covered in a sheet or tarpaulin, because burnt tissues all too easily crumble into small pieces.

In examining the surrounding locality, the investigator should bear in mind that in putting out the fire, the firemen will probably have trampled on any footprints or other vehicular

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ce of this, intervertebral gristles shrink, the skeletal bones crinkle, and the overall measurements of the corpse will be significantly less than those of the same person when he was still alive.

traces in the areas immediately adjacent to the scene of the fire. In places a little bit further away, such clues may well be found; accordingly, such areas should indeed be searched.

All items of real evidence should be thoroughly well packed, and if there is a smell of some inflammable substance on certain items, these should be put into P. V. C. bags, oilcloths or such jars as are fitted with ground glass stoppers.

Where possible, air samples should be taken from the scene of the fire, and this is done to determine whether or not any inflammable liquids were used in an act of arson. Such can be verified by testing for vapours in the surrounding air, for wherever there is petrol or kerosene, for example, there too are their gaseous forms. The investigator can carry out an onsite, preliminary test of these samples, by using so-called nephelometric method. This is done by pouring a table-spoon full of acetic acid into a bottle of the air under test; for 20 minutes or so, the bottle should be gently shaken, as if washing the sides thereof with the acid; this is done to absorb more effectively whatever vapours there may be of kerosene or petrol. The contents should then be poured into a test-tube, diluted with distilled water, and turned upside-down a few times without shaking. Any hydrocarbons present in the kerosene or petrol will separate out as an emulsion.

Air samples for such a test are collected, either by pumping the air in the bottle or by pouring out some water from full bottle (and in so pouring out the liquid, the bottle sucks in the air to be tested). In this way, several bottles should be filled in various positions on the scene of the fire, and such information pertaining thereto as is relevant should all be recorded in the minutes.

The investigator can also use the linear calorimetric method of analysing the air. For this purpose air is passed through a special indicator tube, a reagent placed therein quickly changes colour from orange to green if the air contains any traces of kerosene or petrol.

Any analysis of an air sample carried out on the scene of the fire should be repeated in laboratory conditions.

The Search and Seizure. A body search, and searches of the home and place of work of the suspect are usually conducted after the examination of the scene of the fire, and on account of the results thereof. Such searches are carried out in the hope of finding igniters and/or other items similar to those already found on the scene of the fire. If valuable items, equipment, official documents or other items have been misappropriated from the premises where the fire started, then the search should be conducted, not only to find the means by which the act of arson was executed, but also to discover such stolen property, and any fingerprints of the arsonist which may be upon them. In such a search, attention must be paid to letters, diaries, notebooks and other documents wherein there may be some information as to who is guilty of the arson, and what were the goals and motives of the crime.

When investigating a case of arson or criminal infringement of the fire-safety rules, the seizure of the documents is also an investigatory activity which should be carried out immediately. An important piece of evidence in a case of arson may be:

— documents testifying whether or not verification of the state of the fire safety in the premises concerned was carried out;

— documents pertaining to the storage and transport of such explosives and inflammable substances as are on the premises;

— a written-up record of fire-fighting measures taken by the fire-authorities in extinguishing the blaze;

— local rules concerning safety and fire-safety;

— inventories and lists of property held on the burnt premises;

— materials relating to previous fires on the premises; and

— all the other documents which are relevant to finding out how and why the fire happened.

Furthermore, the investigator should ask the local meteorological station for information as to the weather conditions, air temperature and wind speed and direction at the time of the fire.

The Examination of the Suspect. In preparing for and carrying out the crime, the arsonist may well stain his hands, clothes or shoes with an inflammable substance, he may singe his hair or burn his skin. There may be the remains of some igniting materials in his pockets, his clothes might have retained the smell of an inflammable substance, or maybe they will retain either some traces as to the singeing, spots of soot or burnt patches. And this is why the examination of a suspect must be followed by an examination of his clothes and shoes, and such may divulge real evidence. In examining the clothes, shoes and body of the suspect, the investigator should identify exactly which spots were where, what were their size, colour and form, and how concentrated was the deposit and smell thereof. The use of an ultra-violet lamp is recommended, for under the influence of such a lamp, spots of kerosene or other inflammable liquids give off an intense fluorescence.

The investigator should record the singed parts of the clothes, head, hands and face. It is necessary to make clear not just the size and relative dispersal of these affected parts, but also the overall degree of singeing and its conspicuousness. The arsonist, on noticing the clues he is making, tries to destroy any indications of singeing by cleaning these singed parts of his hair or of the fibres of his clothes; he might even attempt to cut them off. For this reason, a singe mark is often rather indistinct and sometimes indeed subject to doubt. In such situations, the investigator should invite a forensic-medical expert (biologist) or one accomplished in criminalistics to take samples of singed hair (clothes) to conduct expert examination. The presence of cut-off patches of hair or clothes should be recorded in the minutes. In disclosing the body burns on the suspect, it is necessary to record in the minutes their exact place, the number thereof and the degree of burning involved; the last item is done in accordance with the standard medical practice of describing burns according to their degree of severity. If the suspect indeed suffered certain burns, he should be sent to the forensic-medical examination. If any soil, ash, grass or leaves from the locality of the fire are found on his shoes, or if some inflammable substance is detected thereon, they should also be sent away for examination.

An Expert Examination. In the category of crimes in question, various examinations may be carried out. Such include a technical examination of the fire, a forensic-chemical one, an expert criminalistic examination, and an expert commodity examination. Furthemore, if people have been injured or cattle killed, a forensic-medical examination or a forensic-veterinary one will be initiated.

The *technical examination* helps to solve a wide range of problems, some typical examples of which are as follows: where the source of the fire was located; what was the technical cause of the fire; which of the fire-safety rules used on the premises were infringed and whether or not their infringement was a feasible cause for the fire and its spreading; whether or not any of the objects or materials on the premises were able to undergo spontaneous combustion (or self-ignition) and if so, under what conditions; for how long such items burn; which rules for fire safety at work were infringed, and whether or not there were any relaxations in the rules for storing and transporting inflammable materials, and if so, whether or not this was a possible cause of the fire; what was the state of the electric power-supply, of the heaters, lighting, gas and ventilation systems, and whether or not any defects in them were a possible cause of the fire; which instruments and methods were used in committing the arson.

Such an examination should be initiated after the investigator has completed his immediate investigatory activities, the examination of the scene of the fire, the interrogation of eyewitnesses, and so on. The effectiveness of this expert examination is conditioned by a thorough study of the site of the blaze.

The main function of a *forensic-chemical examination* is to resolve the following questions: what was the original substance whose only remains are now a charred object? what items were there at the centre of the fire? do they, or the ashes and cinders contain any remains of traces of an inflammable substance?

In cases of arson, an *expert criminalistic examination* is more often than not initiated in order to identify a person from his fingerprints; to identify his shoes; to determine the individual characteristics of the arsonist by examining the tracks of footprints he left behind, and furthermore, it may be asked to resolve the question of whether or not the items found on the scene of the crime and those removed from the suspect are parts of the single whole.

An *expert commodity examination* is designed to determine the batch number of clothes, rags and other similar materials used by the arsonist.

And, finally, a *forensic-medical examination* can answer the following, specific questions:

— was death caused by burns, asphyxia or something else?

— was the victim alive or dead when its body was burnt?

— what caused the burns — flames, inflammable liquids or scorching gases?

— were there any other injuries on the corpse, and if so, of what sort?

— with what weapons were such wounds as a fractured skull inflicted, or did they result from very high temperatures or as a consequence of some mechanical event? and lastly,

— of what degree were the burns received?

The Interrogation of Witnesses and Victims. In a case of arson, the first people to be questioned are the eyewitnesses of the crime, the ones who were first to observe the blaze, those who helped to put it out (members of the fire-brigade and mine-rescue services, etc.), then those civil servants and others who work on the premises concerned, and any other relevant witnesses. Important information might also be obtained by questioning the victims. It should be noted, however, that the victims may in all honesty be confused; this might lead them to distort the actual circumstances of the fire as a result of shock, fright, or because their attention was distracted by the rescue efforts.

The interrogations of witnesses and victims are basically directed at investigating the following three groups of questions:

(1) as to how and why the fire caught blaze, developed and how it was put out;

(2) as to the fire-safety situation on the premises; and

(3) as to which particular persons are suspected of the crime. In questioning eyewitnesses, those first on the scene, those who helped to extinguish the fire and the victims thereof, it is hoped to find out:

— when each of the above persons arrived at the scene, and what was the then state of affairs;

— who first noticed the fire and reported same;

— when, where and how the fire started;

— whether or not the fire started in several places simultaneously;

— whether or not the witnesses observed any other symptoms of arson;

— how the fire developed and spread, how intense was the blaze, what was the wind speed and direction, whether or not there were any special draughts, what was the colour and density of the smoke, what was the nature of the flames, and what were the characteristics of the smells and tastes at various times of the fire.

While interrogating the witnesses and victims, it is also necessary to find out:

— if they noticed any changes on the scene of the fire and how the fire was actually extinguished;

— where the real evidence, if any, was located;

— if the witnesses saw any such items, igniters for example, in the possession of persons allowed onto the premises;

— from where and in what state the victims, corpses and/or dead animals were brought out from the fire;

— what actual damage was done;

— what was the state of the on-site, fire-fighting equipment, and if anything had been done, either to facilitate the intensification of the fire, or to hinder those trying to extinguish same;

— if any extraneous persons had appeared on the site prior to the fire;

— which persons had been allowed to enter that place where the fire started;

— are there any assumptions as to the cause and the culprit of the fire, and if there are any, on what evidence they are based;

— if anybody who might have been interested in an act of arson had actually expressed an intention of so doing; and finally,

— if any of the witnesses had noticed any furniture or other items being taken from a dwelling place prior to a fire therein.

In seeking to establish the state of fire safety on the premises, the witnesses should be asked:

— if any infringements of the fire-safety regulations had been sanctioned, and if so by whom;

— what was the state of the heating, lighting, gas, ventilation and water systems;

— what was the condition of the fire-fighting equipment;

— whether or not any explosives or inflammable materials had been stored on the premises;

— if an explosion had preceded the fire; and

— whether there might have been any other causes which could have started the fire.

Interrogating the Suspect and the Accused. In the initial interrogation, the suspect is usually asked to explain that circumstantial evidence which indicated his possible participation in the act of arson. Thus, if certain items or parts thereof were discovered on the suspect, and if such objects were similar to those detected on the scene of the fire and used in the arson, he should be asked right at the beginning of the interrogation to explain this fact, and he should spell out in detail how he came to be in possession of same.

If, during the body search or inspection of his clothes and shoes, detected were some spots or smells of inflammable substances, signs of singeing or burning, or particles of earth from the scene of the fire, he should initially be asked to explain how this evidence came to be.

In the course of the interrogation, it may be helpful to make use of the fact that the accused was actually present on the premises before the blaze caught fire, and especially if he had no reason to be there. And those definite, well-established facts which testify to the way the suspect acted both immediately prior to and after the crime was committed, may also be used to get him to speak the truth.

A typical subterfuge of an arsonist observed on the scene of the fire — and it is a subterfuge difficult to expose — is the suggestion that he appeared at the fire to help put it out. Experience suggests that having carried out an act of arson, an arsonist will quite often reappear on the scene of the fire so as to take part in extinguishing same and in this way to reduce the suspicion that would otherwise be upon him, to destroy the traces he had left behind, to find out what people say about the cause and the culprit of the fire, and to undertake such measures as may destroy evidence, pass the suspicion onto others, or flee. In interrogating a suspect as to how and why he was present on the scene of the event, it may be useful to employ either the evidence of those witnesses who fought the blaze, or the results of the inspection of the scene of the fire. By these means it is often possible to say, when the suspect appeared on the scene of the fire, by which route he came, what he did while present on the scene, and whether the evidence of the suspect as to his approach route corresponds with the disposition of the track of footprints as have been detected, and so on.

More often than not, the suspect will not only deny his participation in an act of arson, but he will try to suggest the fire was started by various accidental factors. A reliable way of exposing such a ploy during the interrogation of the suspect is the employment of findings obtained during technical and chemical expert examinations of the circumstances of the fire.

In questioning a suspect or an accused person, it is logical to use circumstantial evidence, such as the fact that instruments of arson were found in his possession, pungent traces of inflammable liquids were detected on his clothes, singe marks and burns were discovered on his body, and his presence and behaviour on the scene of the fire were observed. In so doing, the investigator can persuade the person being questioned to speak the truth.

CHAPTER XXXIII

INVESTIGATING CRIMINAL INFRINGEMENTS OF THE LAW FOR THE PROTECTION OF THE ENVIRONMENT

1. The Criminalistic Description of Infringements of the Law for the Protection of the Atmosphere and Water Resources

One of the most important problems confronting the human race is the protection of the environment from pollution and especially from all harmful human activities.

In the USSR, the obligation to protect the environment is enshrined in the Constitution. In Article 18 thereof, it is emphasised that, "in the interests of the present and future generations, the necessary steps are taken in the USSR to protect and make scientific, rational use of the land and its mineral and water resources, and the plant and animal kingdoms to the purity of air and water, ensure reproduction of natural wealth, and improve the human environment."

The legislation concerns the pollution of rivers, lakes, reservoirs, other surface waters and water sources, canals, underground waters and glaciers, inland seas, territorial waters and the national air space.

Water pollution takes place in different ways, the main one of which is the disposal of untreated and unneutralised waste products from power stations, transport, industrial, agricultural and other enterprises. Liquid wastes can be subdivided into five categories:

— wastes from bath-houses and food-catering establishments;

— industrial wastes from thermal electric power stations and technological processes;

— agricultural wastes from poultry and cattle farms;

— drainage from watering crops or from flushing the land from salinisation, and

— unneutralised or untreated or inadequately cleansed discharges, as well as those wastes cleansed in accordance with the law.

The main atmospheric pollutants are sulphurous gases, oxidation dust and the nitric oxides and carbon monoxides, and these are discharged into the air by metallurgical works, nickel and aluminium processing plants, oil-refineries, the chemical industry and power stations. The following substances are particularly harmful: lead, mercury, phenol, soot, hydrogen sulphide and the compounds of flourine.

In investigating a criminal release of pollution into the ecosphere, it is often quite difficult to establish the particular enterprise which is the source of the pollution, especially in those instances when there are a number of potential sources in the polluted zone concerned. The identification of the source of pollution helps to narrow the circle of suspects, and identify the persons guilty of the crime. In disclosing the source of air or water pollution, it is sometimes helpful to know the location of those other enterprises which are discharging similar substances into the ecosphere. In these instances, the time at which the particular criminal discharge occurred is very important. Information about both this and other factors facilitates, firstly, the disclosure of the exact source of the pollution, and secondly, the identification of the persons responsible.

An important part of the criminalistic description of pollution is the information pertaining (a) to the means by which the crime was committed; (b) to the sequence of actions (or inaction) by the persons responsible.

Inaction normally involves a failure to carry out the instructions either of the government health inspectorate or of the regional water distribution and preservation authorities. These instructions relate to the use and care of waters; to the neutralisation of industrial wastes; to the initiation of measures for preventing or liquidating, firstly, the pollution of surface and underground waters, and secondly, discharges and industrial or domestic wastes into the atmosphere; failure to construct waste-treatment plants, or to take other appropriate measures also costitutes inaction. The issuance by responsible persons of instructions for the release into the ecosphere of untreated industrial and domestic liquid wastes, domestic rubbish or other waste products, is also regarded as a criminal act leading to the pollution of atmosphere or water.

2. Theories of the Crime and the Planning an Investigation

Criminal proceedings in a case of air or water pollution are usually initiated:

— as a result of information received from fishery protection services, regional water authorities (whose job it is to regulate both the use and the care of waters), local meteorological stations, nature conservation departments, health-protection agencies, and social organisations;

— on the basis or articles and letters published in the press;

— according to the submissions of individual citizens; and

— on information received by inspectors' searches, etc.

In establishing grounds for initiating a case of pollution, it is first of all necessary to find out whether or not the fact took place of air or water pollution which was the cause or possible cause, either of personal injury, or of harm to farm animals or the fish supply. Accordingly, one must know the quantity of discharged substances, the type thereof, the results of laboratory water analyses, the area of land or stretch of water polluted, and the number of fish killed, etc.

And in initiating such criminal proceedings, it is necessary to consult the corresponding regulations, for instance, the rules for the protection of surface waters from the pollution by liquid wastes, or the instructions for the care and protection of fisheries and the fish supply.

The investigator's decision as to whether or not a criminal case should be initiated is based on a number of necessary verification measures, on conclusion of which he will receive a number of documents:

(1) a statement as to the infringements of the rules for the care and use of water resources, and various diagrams of rivers, reservoirs, disposal sites, the movement of poisoned waters, the flow of treated waters and the location of treatment stations;

(2) an estimate of the damage done to the water supply of rivers and reservoirs;

(3) information as to quantity of wastes disposed, their type, the importance of the reservoir concerned for fishing and fish-breeding, etc.;

(4) statements as to the results of tests both of liquid wastes and of the soils affected thereby; and

(5) letters and statements of eye-witnesses, televised commentaries, newspaper articles, summaries and radio broadcasts.

In many instances, an examination of the scene of the event is carried out, even prior to the initiation of a case.

In criminal cases, it is necessary to establish:

(a) that pollution has taken place in rivers, lakes, reservoirs or water sources, as the result of discharges of untreated and unneutralised liquid wastes by industrial, agricultural and municipal facilities, departments or organisations; and

(b) that such pollution caused, or threatened to cause, personal harm to individual people or physical injury to farm animals or fish stocks; or

(c) that such air pollution as has taken place as a result of industrial discharges is harmful to human health.

Accordingly, it is necessary to find out:

— how did the air or water pollution actually manifest itself?

— which stretch of water or area of land was polluted?

— what caused either the discharge of untreated and unneutralised liquid wastes and other waste products into the water supply, or the discharge of harmful industrial waste products into the atmosphere?

— which rules for the care of fish stocks and surface waters from the pollution of liquid wastes, and which regulations for the care of the atmosphere, were infringed?

— what were the consequences of these infringements, and what material damage was caused?

— does the given infringement have the marks of *corpus delicti*?

— where (in what stretch of water or in what area of land) is the immediate source of the pollution (i. e., where is the factory, the vessel or the purpose-built machine, etc.)?

— who is guilty of the air or water pollution?

— when was the crime committed, and over what period of time did the discharge of industrial wastes continue?

— what causes and conditions prompted the crime, and what were the criminal's aims and motives?

In the first stage of the investigation, the investigator tries to identify the source of the pollution, the type of substance involved, the means by which the air or water pollution took place, and the reasons for why it happened.

In the subsequent stages, having obtained certain information as to the causes of the pollution, having studied technical and other documents, and having acquinted himself with the structure and activities of the enterprise in question and its waste-treatment facilities, the investigator tries to find out and verify who committed the crime, what motives lay behind the crime, and what conditions facilitated an infringement of the rules for the care and protection of surface waters and the atmosphere.

In planning an investigation, consideration is given to the joint operation between the investigator and various scientific research laboratories and special departments, as well as with certain experts and workers from the health inspectorate.

The extent of the pollution and the harmful effects it caused determine the extent of the investigatory activities and the line to be taken in the investigation, as well as the need for the formation of a team of investigators. The time when the criminal pollution was detected determines the scope of preparatory work and the sequence of investigatory activities. For instance, if a case is initiated immediately after a discharge of untreated liquid wastes occurred, the investigator should carry out a search of the scene of the event without delay; furthermore, he should identify and remove any material traces of the deed, and question eyewitnesses. If the case is initiated only after a certain period of time elapsed since the event, it is expedient to get acquainted first of all with the activities and nature of the enterprise concerned and with its treatment facilities, to study and analyse and if necessary remove any relevant technical documentation, and initiate an expert examination.

The inclusion of inspections in the investigatory activities is recommended. In addition, the investigator may commission both the questioning of those who live near the scene of the pollution and a thorough combing out of the locality, in order to find real evidence, to establish the source of the pollution (and it might be a mobile source, a ship or some special machine), and to identify those criminals who have escaped detection. Sometimes, indeed, he will initiate a "hot pursuit" for them.

If the case is initiated immediately after receiving relevant information on, for example, an act of criminal pollution by a car driver (when a driver of a sewage disposal machine pours some waste products into a town's sewage collector which flows into a river) the investigator should immediately organise a search of the machine; to identify the driver and any others who might have helped him to pour out the waste products; to detain the suspect; to examine the scene of the events; to identify and remove any material traces of the crime; to identify and question any witnesses who might have seen the wastes being poured into the drain well; and to initiate such expert examinations as may be necessary. The success of the investigation in the given instance depends on the speed and efficiency of the initial investigatory activities and operative-search measures.

If the case is initiated as a result of information received from those official organisations whose job it is to supervise the observance of the law for the protection of nature, then one of the initial tasks should be a planned verification — in a legal, procedural way — of those circumstances which were not commented upon in the submitted statements. First of all, the workers of the regional water distribution agency should be questioned as, too, should be those of the health-protection agency who detected the pollution and presented information to the inquest. Other initial tasks include an inspection of any relevant documentation, a search of the scene of the events and the initiation of expert examinations. In addition, and depending on the particular circumstances involved, the investigator will organise a questioning of any eyewitnesses or any employees of the enterprise who are connected with the storage, transport and destruction of harmful substances, with the source of pollution, and/or with the consequences thereof. In certain instances an investigatory experiment may be carried out, as when it is required to establish:

— if particular phenomena can be observed in certain, definite situations;

— what was the volume or quantity of harmful substances discharged in a certain period of time;

— how the pollutants came to be in the water system, and

— where exactly was the source of the pollution.

In verifying the initial theories as to who is guilty of the pollution, the investigator should make sure that the said person performed those of his duties as relate either to the use of the treatment facilities or to the storing and destruction of harmful materials, at the very moment when the rules and regulations were infringed.

In so doing, the investigator must both explain which factors facilitated the commission of the crime, and initiate such measures as shall eliminate same.

These factors may be of an organisational nature: mistakes in planning production and in the design of treatment facilities; the incompatibility of the volume of intensively increasing production, and obsolescent technologies; commissioning of newly-built enterprises or individual workshops and units not fitted with treatment equipment; poor educational work among those whose job it is to treat liquid and industrial wastes; and unsatisfactory work in those organisations instructed to carry out appropriate measures for the prevention of air and water pollution.

Factors of a technical nature may also facilitate the commission of such a crime (for example, defects in the construction of the treatment plant; technical inadequacies in the treatment processes; and the absence of the necessary technical controls for the normal working of purification equipment, dust and ash collectors, and other machines designed to guarantee the cleanliness of industrial waste).

The basic means by which the investigator prevents any air or water pollution from taking place is by making representations to the corresponding enterprises. Preventative work can be made more effective if such are made, not only at the end of the investigation, but at any stage thereof, depending on the particular circumstances of the case.

3. Tactics of Investigatory Activities

An Examination of the Scene of the Event. The particular features of an inspection of the scene of the event in the given category of crimes are conditioned by the fact that a multitude of objects and large areas of the polluted lands and waters are to be inspected; and by the unusual conditions in which in a number of instances the inspection is carried out (i. e., in the water, underground, and sometimes even underwater).

In those instances when a defined area of water has been polluted with petroleum products, a thin film can be observed on the surface of the water; a sedimentation of the heavier compounds can be found on the bottom, dissolved particles and emulsions can be detected in the water, and other particles may have been adsorbed by the soils on the bed of the reservoir. Oil products can change the physical properties of the water (its colour, transparency, taste and smell), as well as its chemical properties (the content of oxygen, oxidation, etc.). Polluting substances (especially the harmful, industrial waste products, gases, vapours and dust, discharged into the atmosphere), may sometimes be spread over dozens of square miles. In such instances, the area to be examined should include the entire polluted area as well as those adjoining areas where the immediate source of the pollution, traces thereof, or other real evidence may be found. In the given instances, the term "scene of the event" means not only that place where the consequences of the pollution were found, but also the place where the immediate source of the pollution is located.

The purpose of the examination is to identify and detail the general and particular circumstances on the scene of pollution; to locate, identify and remove traces of pollution, dead fish, and damaged agricultural products; to detect any sources of pollution; and to determine the degree to which the land (and the waters) have been polluted.

Where necessary, the appropriate specialists should be called in to assist in the examination of the scene of the events: workers of the water protection authority, the state sanitary inspection, the fishery protection services and the state inspectorate of gaseous emissions, etc. Such as these are able to help, in detecting, identifying and removing clues of the crime, and in using such special equipment, apparatus and volumetric measuring devices as are necessary for an examination.

It is expedient to distinguish between the central and peripheral sectors of the scene of the events.

The term "central sector" denotes that area of land or stretch of water where the pollution took place and where typical consequences thereof can be found. It may also mean that place — and its adjoining locality — where the source of the pollution is situated, and this could be the location of either a purification plant, cesspool, boiler-house, scrap-heap or dust-cum-ash collector. Having investigated the source of pollution, the investigator will inspect the adjoining localities, moving outwards from the centre towards the periphery in a spiral motion. The peripheral sector includes the definite area of land or stretch of surface water which was polluted. The central sector is examined thoroughly; the periphery, in a selective manner. If the investigator fails to find the source of the pollution, it is expedient for him to start the examination by inspecting the land or waters polluted. Especial attention is paid to that place where the greatest concentration of dead fish was found, and/or where there is an accumulation of industrial waste. Overgrown shrubbery and reeds should be inspected thoroughly, as indeed should any backwaters or dams. In the course of the inspection, such measurements as are necessary will be recorded. Water samples will be taken in that area where the dead fish were detected, both up-river and down-river from the supposed source of pollution over a distance of 0.5-1 km; a few dead fish of each type will be taken away for laboratory testing, as too will be a few air- and earth-samples.

Significant difficulties often occur when the source of pollution is situated under water; such might involve a broken oil bore-hole or the damaged hold of an oil-tanker, etc. In those instances when the search is conducted by divers, the investigator should not include in the minutes of the inspection such information about the object being investigated as is given by the divers. But then, of course, it will be necessary to question the latter as witnesses, thereby to establish detailed diagrams of the said object. To this end, underwater photographs or motion-pictures should be taken by a specialist. It will then be required to include such photographs, films and negatives in the exhibits for the case, as enclosures to those minutes which pertain to the questioning of the specialist.

An initial investigatory activity is usually the *inspection of relevant documentation.* It is especially effective in those instances when the investigator analyses, not only the information contained in one document, but the contents of many books and records; sometimes, by collecting little snippets of knowledge, he can collate and coordinate valuable factual information.

The documentation to be submitted to inspection may be divided into the following groups:

(1) books (registers) of liquid industrial wastes, and such documentation as refers to the disposal of same in a scrapheap or dumping ground;

(2) blue-prints, statements of commissioning and other documentation relating to purification plants, filter units and sedimentary tanks;

(3) operational (shift) registers of those engineers, chemists and other responsible workers in thermo-electric power stations, heat- and power-plants, steam turbines, boiler houses and other energy-generating stations, and in particular their registers of monitoring refuse liquids;

(4) rules, orders and regulations for the use of power supplies and sewerage systems, and permits for the disposal of refuse liquids;

(5) orders, invoices, dispatch notes and other documentation relating to the work routines of transport companies (and transport sections in other enterprises) involved in the transportation of industrial wastes;

(6) maritime documentation;

(7) orders, regulations, information sheets and other documentation relating to defects, repairs and construction work in purification stations and sewage plants;

(8) operational monitoring registers, verification documents and other similar documentation of the chemical/hydrological laboratories of the inspector of reservoirs; of the health service stations; and of the laboratories of industrial enterprises; and to conclude this list;

(9) other documentation, be it of a permanent or one-off nature.

In order to carry out a purposeful search for the documents, the investigator should take into account the structure of the enterprise, and the rules and instructions governing the service obligations of certain persons. When he knows how the enterprise functions, what links the various people in the different departments, the competence of these departments and workshops, and the responsibilities of the various persons therein, he will be able to find, inspect and remove the relevant basic and auxiliary documentation quickly and efficiently.

A comprehensive examination of the documentation should employ visual methods of examining the texts, and a logical analysis thereof. Where necessary, i. e., when it is hoped to find signs that a forgery has taken place, a preliminary, technical criminalistic inspection of the documentation should be carried out.

Expert Examinations. In investigating crimes of air and water pollution, a number of difficult questions often arise; to answer same, a specialist knowledge may be required. An expert examination is able to help the investigator establish the time and place of the pollution, the immediate cause thereof, a defect in the purification equipment and why such a defect occurred, the identity of those persons responsible for the infringements of the law, the presence of such factors as may have facilitated the pollution, and so on.

In cases where the rules for the protection of the environment have been infringed, the investigator will invariably initiate the following examinations:

A forensic-medical examination will be asked to establish the cause of death in those instances where certain individuals have been fatally poisoned. Furthermore, the investigator may well wish to pose the following questions: in the case of the enterprise concerned, does the discharge into the atmosphere of soot, dust, ash, fumes and other substances represent a threat to human health? and in what quantities and how do these substances affect the human organism?

A forensic-veterinary expert examination should be conducted to investigate cattle plague and fish deaths caused by the discharge, either of harmful, industrial wastes into the atmosphere, or of unpurified and unneutralised refuse liquids into the water supply. An examination may be carried out of the pastures, various types of fodder and watering places, and the various meat and dairy products. The veterinary experts may be posed the following questions: when did the animal die? why did it fall ill? was it the result of poisoning? what was the poisonous substance source thereof? how did poisonous substance get into the animal? and was death or illness caused by the discharge into the natural water supply of unpurified and unneutralised liquid and industrial wastes?

An ichthyological examination is that which is carried out to define the nature and scale of the damage caused by the water pollution to the fish industry, to find out the cause of death of the fish and plankton, and to determine the prospects for the re-establishment of food organisms in the waters in question. During the examination the following questions may also be posed:

— what quantity of a particular type of fish has changed its natural characteristics?

— is the cause of the damage to the fish stocks the discharge of unpurified and unneutralised refuse liquids in which certain substances are contained, petroleum products, for example, at levels of concentration greater than those permitted?

— insofar as the fisheries are concerned, what harm was made to it by the discharge of refuse liquids and other industrial wastes?

— what, in the particular reservoir concerned, was the cause of sickness or death, and so on?

A hydro-meteorological examination will find out: whether or not, in the prevailing weather conditions, the particular industrial waste products could have spread over the given area from just the given source; what, in the given meteorological conditions, was the current outflow from the reservoir concerned; and what is the size of the area polluted, and in the given weather conditions, how far and wide will it all spread? The above examination will need to call for the assistance of ichthyological scientists, research scientists, meteorological specialists and government inspectors of purification plants and dust collectors.

A forensic-technological examination is conducted to find out if the air or water pollution might have been caused by an infringement of the technology employed at the given industrial enterprise. These involved in the expert examination may well be asked the following questions: does the technology of the purification of gas and refuse liquids applied in the enterprise concerned correspond to the blue-prints thereof? does the actual technological process correspond with its claimed performance? what were the technological reasons for the release of the untreated industrial wastes into the atmosphere? and why were liquid wastes released at levels of concentration in excess of the permitted standards?

A forensic-technical expert examination is aimed to find out the reason for the faulty performance of the purification plants; the technical defects in the sewerage system, in the equipment used for absorbing and collecting the harmful substances, in equalising reservoirs or water traps; and which particular individuals are responsible for allowing certain rules to be broken and, as a result, pollution to take place. The experts may also be set the task of asking some other questions: is the technical condition of the machinery and purification equipment as it should be according to the blue-prints thereof? is it all in working order? what caused the purification equipment to be defective, and when did such defects occur? and what organisational-cum-technical measures should be undertaken to prevent any further air or water pollution?

A forensic-biological examination is sometimes carried out to establish the biological reasons for the harm done to animals, plants or the natural water supply.

A hydro-technical examination is aimed at explaining the technical state of the identified sources of pollution; the quality of construction in the purification plants, technical equipment and various other bits of machinery; and the correct accounting of water flows, both where the water is used, and where the refuse liquids are actually discharged.

In investigating the given category of cases, it is sometimes necessary to apply specialist knowledge in several branches of science simultaneously. In such instances, the investigator will ask for a joint conduct of examinations: sanitary and technical, veterinary and biological, ichthyological and biological, medical and biological, and so on.

In resolving the question of who is responsible for breaking the law on the preservation of the environment, it is necessary to take into account not only factors of health and hygiene, but also ecological ones. Where necessary, the investigator should order for *forensic-ecological examinations* by inviting thereto both distinguished scientists in the field of ecology, and experts in the health and sanitation and from the departments for the care and protection of forests and waters.

The Interrogation of Witnesses. Witnesses can be divided into three groups, depending on the content of the information which they divulge.

The first group consists of those persons who reported the disclosure of the criminal pollution and its consequences. During questioning, they should be asked, firstly to explain the circumstances in which the criminal pollution was detected, and secondly, to indicate the consequences and the source of the pollution. The most detailed information in this regard can be obtained from those who work in the corresponding inspectorates, for it is they who are responsible, not only for identifying the damage inflicted on the fisheries, but also for searching the entire polluted area. In the course of the interrogation, it is desirable to draw up a plan of the area, showing where the witness was situated at the time, where he saw the greatest quantity of dead fish, and where the pollution was concentrated.

The second group consists of those who can confirm the fact that harmful industrial wastes were released into the atmosphere or the natural water supply, and can identify the source of the pollution; these witnesses may be workers or civil servants in the purification station, eyewitnesses of the release of industrial wastes, and so on. They in their turn should be asked to explain the circumstances in which untreated refuse liquids were discharged into the natural water supply, and in which industrial waste products were released into the atmosphere. If the source of pollution is on the territory of an enterprise, then the eyewitnesses may sometimes refrain from giving evidence or they may keep valuable facts of the event to themselves, either because they do not want to exacerbate their relationships with the management, or because they are trying to cover up the mistakes of a colleague. The interrogation of these witnesses — representatives of the administration, fellow-workers in the chemical laboratories of the enterprise, and so on—must concern not only the circumstances in which the waste products are discharged, but also the specific work of the enterprise, its purification facilities, and the organisation of those who enacted controls which relate to the content of industrial wastes released into the surrounding atmosphere or natural water supply.

The third group of witnesses are those whose evidence may contain information about the reasons for the damage to the purification plant or its improper exploitation; about the organisation of temporary dumping grounds in unprescribed places; and about the discharge of refuse liquids. Such witnesses may include the management of the enterprise, their deputies, senior engineers and senior technologists. They should be asked about those factors which enabled the pollution to take place. Questioning these witnesses is difficult, because some of them might actually be guilty of the criminal pollution. Therefore, the interrogation should be thoroughly prepared. The success of the interrogation depends to a large extent on the investigator's knowledge of the particular features of production in the given enterprise. During the interrogation of these witnesses, they should be asked to explain the situation prior to the pollution, the state of the purification facilities, the conduct of those various individuals responsible for the observation of special rules in the enterprise, and lastly, the cause of the pollution. Other witnesses (the accused person's co-workers, neighbours and so on) may also be questioned as to the personality of the accused.

Interrogating the Accused. The accused, on seeing the accumulation of proof of crime and realising full well that it is pointless to deny his guilt, will often confess to the crime he has committed. Quite often, however, by giving certain evidence he will try to diminish his guilt and keep to himself certain bits of information as to how the crime was committed; sometimes, he may even try to place the guilt on other people, more often than not on his subordinates.

Sometimes the accused will confess only to a part of the crime, suggesting for example that the quantity of pollutants is considerably less than that declared in the accusation. They quite often confess themselves to be guilty of discharging the industrial waste into the ecosphere, but then deny the harmful consequences thereof or refer to the instructions of their superiors and so on. Asking the accused what are his precise responsibilities as laid down in the rules and regulations enables the investigator to show the accused the frailities of his argument. Preparing the interrogation of the accused in the given category of crimes includes:

— a study of the specific technological process in the purification plant. The investigator can get the necessary information by studying the rules and regulations and departmental instructions, technical documents and plans, and specialised literature. In the most complicated cases, he should turn for assistance to the appropriate specialists;

— a thorough study of all the documentation relating to the case in question, especially of those technical docu and registers in which the results of analysing liquid dischar are recorded; and

— a comprehensive study of the personality of the accused.

In preparing the interrogation of one accused of committing a crime in association with others, it is very important to know who to interrogate first, and in what order the others should be questioned. Accordingly, the investigator should take into account the particular deeds of each and the degree to which he has already amassed evidence as to their guilt. And it is, of course, expedient for the investigator to question first of all those whom he reckons will speak the truth more readily than the others.

In questioning the accused, the investigator should try:

(a) to obtain information as to the personality of the accused, his work record (in the enterprise concerned), his professional qualifications, his punishment record, and so on;

(b) to establish the motives of the accused in polluting the air or natural waters. If the accused refers to certain objective factors, he should describe them in detail so as to confirm his arguments; and

(c) to identify who, apart from the accused, participated in the release of untreated refuse liquids and industrial wastes, and what were the roles and motives of each participant. In particular, it is necessary to find out which one of the accused was meant to regulate that piece of equipment, a defect which actually caused the pollution; in association with which rules and instructions was such work meant to be carried out; and how did he carry out the monitoring of discharges. To confirm such evidence, the investigator should study both the actual technological processes involved in the treatment plant, and the means by which the refuse liquids are monitored. He should also find out in which register information about the discharge of refuse liquids was recorded.

The testimony of the accused should be thoroughly verified by comparing it with that evidence received as a result of the examinations conducted, the interrogations of witnesses, the identification of the accused by the eyewitnesses, and the disclosure of real evidence in those places which had been indicated by the accused. The latter's evidence about the place where industrial wastes were discharged may be verified by checking his evidence on the scene of the crime.

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